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HARD CHOICES

A Report on the Increasing Gap Between America's Infrastructure Needs and Our Ability To Pay for Them

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Appendix 17. OHIO

A CASE STUDY

PREPARED FOR THE USE OF THE

SUBCOMMITTEE ON ECONOMIC GOALS AND INTERGOVERNMENTAL POLICY

OF THE

JOINT ECONOMIC COMMITTEE
CONGRESS OF THE UNITED STATES

FEBRUARY 25, 1984

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Preface

Infrastructure problems are widespread. They do not respect regional or state boundaries. To secure a better data base concerning national and state infrastructure conditions and to develop threshold estimates of national and state infrastructure conditions, the Joint Economic Committee of the Congress requested that the University of Colorado's Graduate School of Public Affairs direct a twenty-three state infrastructure study. Simultaneously, the JEC appointed a National Infrastructure Advisory Committee to monitor study progress, review study findings and help develop policy recommendations to the Congress.

In almost all cases, the studies were prepared by principal analysts from a university or college within the state, following a design developed by the University of Colorado. Close collaboration was required and was received from the Governor's staff and relevant state agencies.

Because of fiscal constraints each participating university or college agreed to forego normal overhead and each researcher agreed to contribute considerable time to the analysis. Both are to be commended for their commitment to a unique and important national effort for the Congress of the United States.

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AN ANALYSIS OF OHIO'S INFRASTRUCTURE:

A Case Study

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22 September 1983

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Marshall Kaplan, Dean of the Graduate School of Public Affairs, University of Colorado at Denver, reviewed and critiqued the draft version of this study which improved the final draft considerably. Finally, I would like to thank Len Roberts of the Governor's Office

without whose support this study would not have been possible.

Even with the substantial input and aid from the state's officials, any errors of omission and comission must be attributed to me.

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EXECUTIVE SUMMARY

The infrastructure of Ohio, like most states in the Industrial Belt, is aging and in need of repair. However, no comprehensive study exists which matches the "needs" of this infrastructure with projected expenditures for the infrastructure. This is a first attempt to pull together the disparate data bases in order to assess the needs of the infrastructure. Projections are made for the next two years (which correspond with the state's fiscal years 1984 and 1985) and until the year 2000. Also, estimates are presented for unfinanced needs from the past three years (FY81-FY83) or what is referred to as the "backlog". Infrastructural categories selected for this study include only highways, bridges and mass transit, airports, railroads, wastewater treatment systems, water supply systems, and solid waste disposal systems.

There are approximately 110,820 miles of street, roads and highways in the state of Ohio. The state has responsibility for approximately 19,000 miles or 17 percent of the total. Linking the entire highway system are 14,327 bridges of ten feet (or more) in length, with the state assuming responsibility for 11,634 or 81 percent of them. The remainder of the highways and bridges is primarily the responsibility of counties, townships and cities (although over 370 bridges are owned by private railroads and other private concerns).

Public transportation is provided by sixteen systems serving

the eight largest metropolitan areas. Nine smaller systems serve urbanized areas of under 200,000 people. In addition, fourteen transit systems (public and private) serve nonurbanized areas, over 350 vehicles throughout the state serve the needs of the handicapped and elderly, and a multitude of smaller systems (known as UMTA Section 8 projects) serve small urban and rural areas of Ohio.

Over 95 percent of the urban highways and 80 percent of the rural highways under the Highway Performance and Monitoring System are in "fair" condition which would indicate need for maintenance and repair activities. Approximately one percent of both rural and urban highways are "deteriorated" and in need of reconstruction and major rehabilitation. However, this last figure is somewhat deceiving since over 80 percent of the deteriorated roads are on the urban interstate highway system and almost half of the rural deteriorated roads are on the interstate system.

721 bridges in the state fell below the 50 percent sufficiency mark, indicating that those bridges ought to be replaced, and 4,598 were between 50 and 80 percent sufficient, indicating that major repairs should be made.

Total backlog needs for FY81 through FY83 for the primary, urban, interstate, and federal bridge programs totalled $128.7 million. After state Operations and Maintenance (O & M) backlog needs of $507.5 million and local O & M backlog needs of $5,982.3 million are added, total highway and bridge backlog for FY81 through FY83 amounts to an incredible $6,618.5 million (1982 dollars).

Projected expenditures for these same systems for FY84 and

FY85 compared with anticipated needs leaves a future unfinanced "gap" of $4,239.7 million. Therefore, the unfinanced needs figure for highways and bridges for the five year period FY81 through FY85 exceeds an astronomically high figure of over $10 billion.

Only $34.1 million were spent by the state in FY82 and FY83 on the public transportation system, leaving a two-year unfinanced backlog of $86.3 million (1982 dollars). The state's share of financing mass transit systems for FY84 and FY85 is expected to be $26.7 million and $25.7 million (1982 dollars). If the state's share of total mass transit outlays were at a level of 9.9 percent (which is equivalent to the state's share in an Ohio Department of Transportation, or ODOT, needs assessment), then projected expenditures should be $269.7 million in FY84 and $259.6 million in FY85 (1982 dollars). This would result in unfinanced capital and operating needs of $253.4 million (1982 dollars) for FY84 and $179.2 million (1982 dollars) for FY85.

Therefore, combining the estimated two year backlog needs ($86.3 million) with the projected two year "gap" ($432.6 million) results in a four year "gap" estimate of $518.9 million (1982 dollars) for the public transportation system.

A 1983 study (which only marginally updated a 1974 study) suggested that the long-term viability of Ohio's airport system depends in large part on increasing airport capacity, upgrading levels of service, and providing air access to remote locations. The state estimated that over $76 million needed to be spent for the 1975-85 period, of which the state should provide approximately $3.1 million per year. The state currently provides $550,000 per year. The difference of $2.6 million is unfinanced.

Little information exists on capital and operating outlays and "needs" of Ohio's rail system. Most information (e.g., operating revenues and expenditures) does not separate Ohio's share from the railroad companies' total systems. However, in 1980 ODOT estimated that deferred maintenance "needs" exceeded $78 million and deferred capital improvement "needs" were $169 million, for total deferred "needs" of almost $248 million. ODOT projected that future needs would exceed $670 million, with maintenance "needs" climbing to $234 million and capital "needs" reaching $436 million.

There are approximately 800 wastewater treatment plants in the state of Ohio owned and operated by municipalities, counties, and special districts. Assuming the capital outlay total for FY81, which was $552 million (1982 dollars), remains the same for the near future, a "gap" can be calculated between needs and outlays. The $12.1 billion needs figure for the year 2000 when divided by eighteen leaves an annualized needs figure of $670 million (1982 dollars). If outlays in 1981 can be considered typical of outlays in future years, the annual gap, then, is projected to be $118 million (1982 dollars) annually for each of the next eighteen years.

Over 1,600 public water supply systems exist within the state of Ohio supplying over 1,438 million gallons daily to almost nine million inhabitants. Although water systems are generally in good fiscal condition, their capital needs could not be calculated due to data unavailability. Only the "expansion" needs of Ohio's water systems were available and amounted to approximately $32 million per year. However, because almost half of all Ohio's water systems were constructed prior to World War II, replacement and renovation

needs of the existing physical plant must surely play an important role in any water authority's capital plans.

The state of Ohio divides the responsibility of solid waste disposal into two sections. One has reporting requirements for hazardous waste, the other for non-hazardous waste. No expenditure data, condition assessments, or future facility needs exist for hazardous waste disposal sites. Over 220 land fills for non-hazardous waste serve the entire state of Ohio. Municipalities, townships, and counties own one-third of the land fills, while the remainder is privately-owned. Approximately one-third of these are projected to be filled within five years, requiring construction of new buildings and purchase of additional land. No estimates of the cost of land (which varies by location) exist, so no needs estimates are available.

The total three-year "backlog" needs estimate for the infrastructural categories selected for this study amount to $7.4 billion. The unfinanced "gap" between needs and anticipated expenditures for the biennium FY84-FY85 totals $4.9 billion. Projections to the year 2000 suggest a gap of over $44 billion. The impact of this "gap" and of declining motor vehicle fuel tax revenues and federal participation rates for wastewater treatment systems can only prove to be disastrous to the financing capabilities of the state and, therefore, to the performance of its infrastructure.

CHAPTER 1: SOCIO-ECONOMIC PROFILE OF OHIO

Ohio, like most states in the industrial heartland, has suffered with a high rate of unemployment and out-migration in the 1970's and especially in the early 1980's. Between 1960 and 1970 Ohio's population increased by 9.8 percent; between 1970 and 1980 it slowed to 1.3 percent (Table 1). Nationally, the rate of growth between 1960 and 1970 was 14.2 percent, and it slowed to 7.9 percent in the next decade. Projections to 1990 and 2000 indicate that Ohio's growth rate will be quite small, averaging around 1.4 percent per decade for the next two decades, while the national rate will be four to six times the Ohio rate. With a projected population of over 11 million in the year 2000, Ohio is still one of the largest states in the nation.

TABLE 1: Ohio's Population

	1960	1970	1980	1990	2000
Ohio (000)	9,706.0	10,657.4	10,797.4	10,950.1	11,224.9
U.S. (000,000)	179.3	204.8	221.0	240.0	253.0

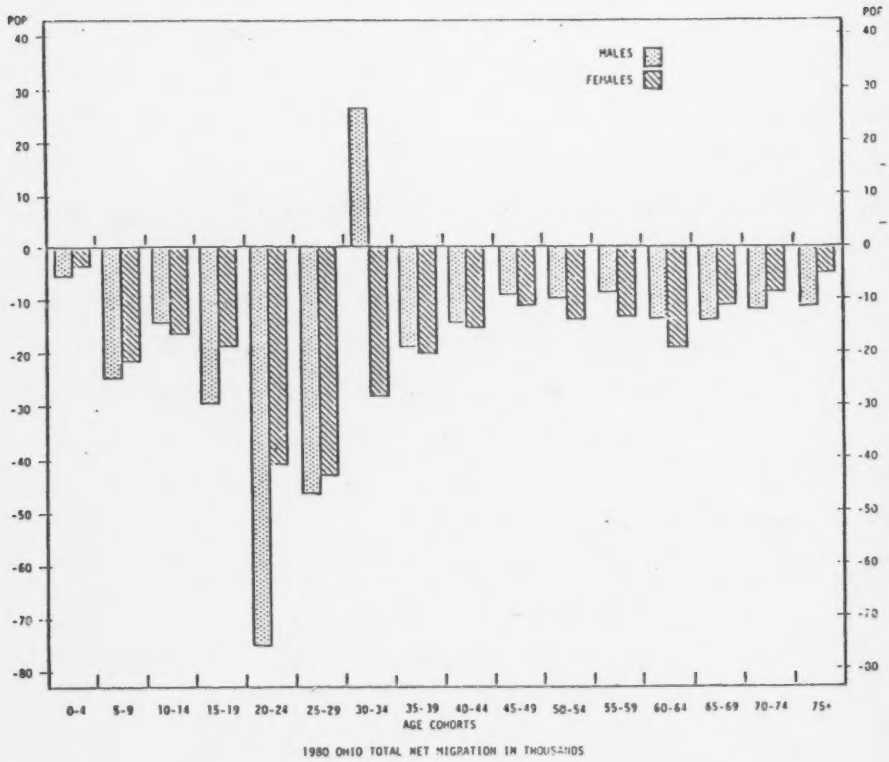
SOURCE: For Ohio data, Ohio Department of Development, Ohio Data Users Center, June 1982; for U.S. data, Blue Ribbon Panel, COLORADO: INVESTING IN THE FUTURE, VOLUME ONE: FINDINGS, July 1981.

The state's increase in population is primarily due to the birth rate exceeding the mortality and emigration rate. Net migration between 1970 and 1980, presented in Table 2, is highest in the 20-29 age category for both men and women. Between 1960 and

Table 2

NET MIGRATION, OHIO AND COUNTIES,

BY AGE AND SEX: 1970 TO 1980



Source:
Ohio Department of Development
Office of Research
Ohio Data Users Center

1970, the 15-24 age bracket suffered the highest loss of migration out of the state (Table 3). As an increasing number of younger people move out of the state, the structure of the total population changes considerably. Projections to the year 2005 demonstrate the effect of this population shift. In 1980, there is a slight pyramidal shape to the population structure. This shifts to become almost box-like by the year 2005 (see Table 4).

Much of the explanation for the low population growth rate and high out-migration rate can be accounted for by the relatively weak performance of the economy during the 1970's and especially since the 1980 recession. Between 1973 and 1980 unemployment in Ohio was fairly similar to (and often below) the rate for the nation. Since 1980, the rate of unemployment has been considerably above the national average, reaching a post-Depression high of over 14 percent of the work force in January 1983 (Table 5). In that month over 738,000 Ohioans were unemployed. Most of the decline in employment was registered in the manufacturing sector. Ohio experienced an absolute decline in manufacturing employment from 1.4 million in 1973 and 1974 to just over 1.0 million in 1983. Nonmanufacturing employment, a growth sector in the nation, witnessed a modest increase from approximately 2.6 million in 1972 to approximately 3.0 million in each of the last five years. Although the increase in nonmanufacturing employment nearly offset the decline in manufacturing employment, the economy has not been able to absorb new entrants into the labor market for over a decade, resulting in the high unemployment rate.

Ohio probably has many of the problems of the older, employment-losing states in terms of its infrastructure; that is,

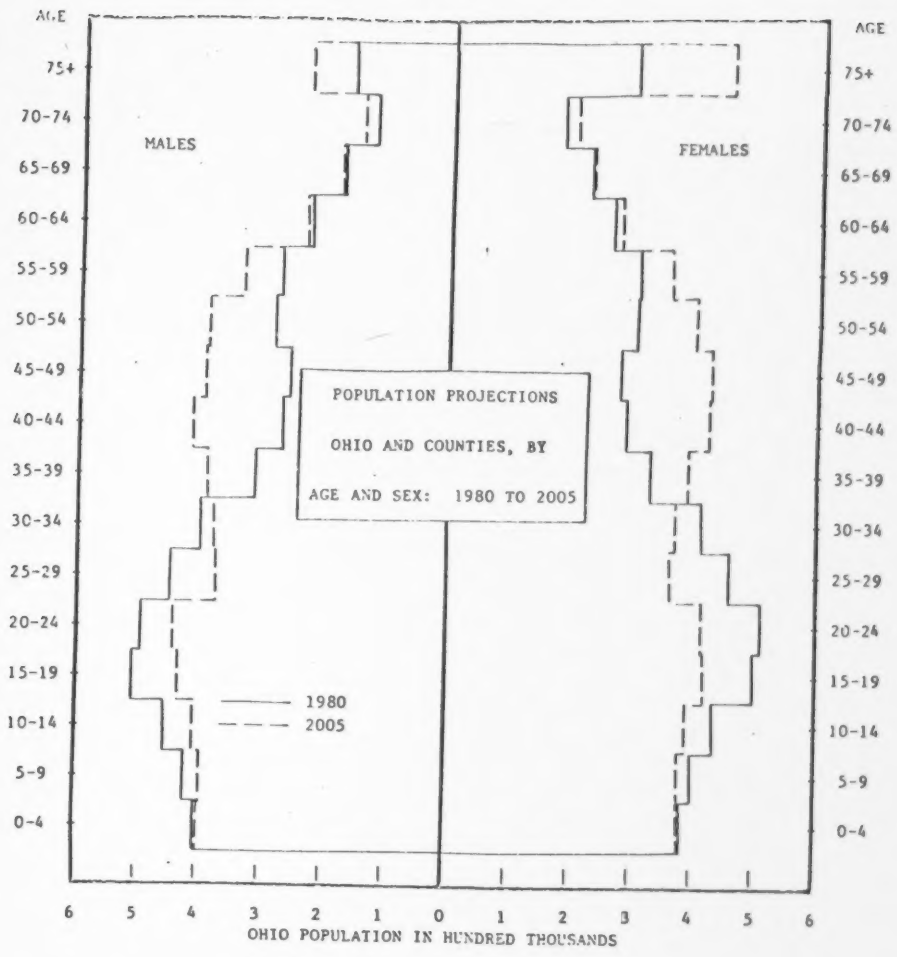
Table 3

OHIO STATE MIGRATION BY AGE AND SEX: 1960-1970

AGE IN 1970	TOTAL			MIGRATION RATE		
	TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE
ALL AGES	-129,315	-89,311	-40,004	-1.2	-1.7	-.7
0-4	15,046	7,610	7,436	1.7	1.6	1.7
5-9	20,319	10,236	10,083	2.0	1.9	2.0
10-14	-14,082	-8,354	-5,708	-1.2	-1.4	-1.0
15-19	-27,576	-24,082	-3,494	-2.6	-4.5	-.7
20-24	-61,848	-66,960	5,112	-6.9	-14.8	1.2
25-29	29,038	18,669	10,369	4.4	5.8	3.0
30-34	32,663	30,156	2,507	5.8	11.5	.8
35-39	-5,081	-80	-5,001	-.9		-1.7
40-44	-10,102	-4,630	-5,472	-1.5	-1.5	-1.6
45-49	-7,818	-3,806	-4,012	-1.2	-1.2	-1.2
50-54	-7,462	-3,522	-3,940	-1.2	-1.2	-1.3
55-59	-9,712	-4,055	-5,657	-1.9	-1.6	-2.1
60-64	-19,093	-8,641	-10,452	-4.3	-4.1	-4.4
65-69	-25,794	-12,753	-13,041	-7.1	-7.9	-6.5
70-74	-18,561	-10,598	-7,963	-6.5	-8.6	-4.9
75 AND OVER	-19,272	-8,501	-10,771	-4.7	-5.4	-4.3

Source: Net Migration of the Population, 1960-70, by Age, Sex, and Color: Part 2--North Central States. U.S. Department of Agriculture, Economic Research Service and University of Georgia, Institute for Behavioral Research and National Science Foundation, Research Applied to National Needs. Athens, Georgia: University of Georgia Printing Department. December, 1975.

Table 4



Source: Ohio Department of Development
Office of Research
Ohio Data Users Center

Table 5

CIVILIAN LABOR FORCE ESTIMATES
(not seasonally adjusted)

Year and Month	OHIO (in thousands)			Unemployment Rate	
	Civilian Labor Force	Total Employed	Total Unemployed	OHIO	U.S.
1972	4,510	4,261	249	5.5	5.6
1973	4,621	4,423	198	4.3	4.9
1974	4,708	4,483	225	4.8	5.6
1975	4,721	4,292	429	9.1	8.5
1976	4,749	4,378	370	7.8	7.7
1977	4,830	4,518	312	6.5	7.1
1978	4,956	4,688	268	5.4	6.1
1979	5,056	4,758	298	5.9	5.8
1980	5,087	4,660	426	8.4	7.1
1981	5,099	4,607	492	9.6	7.6
1982	5,122	4,481	640	12.5	9.7
1982					
April ...	5,061	4,454	607	12.0	9.2
May	5,103	4,536	568	11.1	9.1
June	5,264	4,619	645	12.3	9.8
July	5,274	4,628	646	12.2	9.8
August ..	5,249	4,590	659	12.5	9.6
September	5,136	4,505	631	12.3	9.7
October .	5,177	4,494	683	13.2	9.9
November.	5,088	4,378	710	14.0	10.4
December.	5,058	4,344	714	14.1	10.5
1983					
January .	4,942	4,204	738	14.9	11.4
February.	4,925	4,212	713	14.5	11.3
March ...	5,027	4,339	688	13.7	10.8
April ...	5,088	4,435	653	12.8	10.0

OHIO NONAGRICULTURAL WAGE AND SALARY EMPLOYMENT
(in thousands)

Year and Month	Total Nonagricultural	Manufacturing	Nonmanufacturing
1972	3,938.3	1,346.8	2,591.5
1973	4,112.9	1,426.3	2,686.5
1974	4,169.4	1,416.6	2,752.8
1975	4,016.2	1,267.5	2,748.7
1976	4,094.5	1,295.3	2,799.3
1977	4,230.1	1,344.1	2,885.9
1978	4,394.8	1,377.2	3,017.6
1979	4,484.7	1,382.3	3,102.5
1980	4,367.4	1,264.3	3,103.0
1981	4,317.6	1,232.6	3,085.1
1982	4,138.7	1,103.6	3,035.1
1982			
April	4,146.1	1,117.3	3,028.8
May	4,180.9	1,116.5	3,064.4
June	4,191.6	1,119.3	3,072.3
July	4,131.3	1,104.6	3,026.7
August	4,116.7	1,093.2	3,023.5
September .	4,153.3	1,100.5	3,052.8
October ...	4,133.2	1,073.5	3,065.7
November ..	4,121.4	1,056.9	3,064.5
December ..	4,102.5	1,043.9	3,058.6
1983			
January ...	4,012.3	1,051.7	2,960.6
February ..	4,015.0	1,056.2	2,958.8
March	4,036.2	1,059.4	2,976.8
April	4,076.5	1,071.0	3,005.5

Source: Ohio Bureau of Employment Services, Ohio Labor Market Information, May 17, 1983.

the size of the physical infrastructure does not need to expand as rapidly as that of newer, growing states. The state and the sub-state levels of government generally are less interested in expanding the existing size of the infrastructure than they are in preserving, restoring, maintaining, and repairing what has already been built. However, much of the state's infrastructure is old and worn out and in many cases should probably be replaced. Large capital outlays for those replacement purposes in conjunction with smaller repair and maintenance outlays comprise the basic needs of most states in the industrial belt. These needs, coupled with a weak fiscal base, loom large in the states' finances. Ohio is no exception. What follows, then, is a description of the physical size of a few selected infrastructural categories, an analysis of expenditures on those activities and anticipated "needs", and projections of the state's fiscal capacity to address those needs. As a first attempt to pull together a myriad of sources and data, this report should be viewed with caution because most of the data refer only to state government and ignore the local governments. This limited scope is not a result of oversight but of a time constraint since much of the local data remains at the localities and is not aggregated at the state level in usable form.

CHAPTER 2: HIGHWAYS, BRIDGES, AND MASS TRANSIT

There are approximately 110,820 miles of street, roads and highways in the state of Ohio. The state has responsibility for approximately 19,000 miles or 17 percent of the total. Linking the entire highway system are 14,327 bridges of ten feet (or more) in length, with the state assuming responsibility for 11,634 or 81 percent of them. The remainder of the highways and bridges is primarily the responsibility of counties, townships and cities (although over 370 bridges are owned by private railroads and other private concerns).

Data are available from state agencies -- Ohio Department of Transportation (ODOT) in particular -- for Operations and Maintenance (O & M), condition of highways and bridges, and "needs". These data and studies refer almost exclusively to the state-owned highway system which is a small proportion of the total. Therefore, in order to gain some perspective on the non-state system, "needs" are estimated for the remainder of the system based on the assumptions used to derive needs estimates for the state system.

Public transportation is provided by sixteen systems serving the eight largest metropolitan areas. Nine smaller systems serve urbanized areas of under 200,000 people, and a multitude of smaller systems (known as UMTA Section 8 projects) serve small urban and rural areas of Ohio. In addition, fourteen transit systems (public and private) serve nonurbanized areas and over 350 vehicles throughout the state serve the needs of the handicapped and

elderly. Because of data limitations, these latter two groups will not be discussed in the mass transit section of this chapter.

HIGHWAYS AND BRIDGES

Physical Condition.

The Present Serviceability Rating (PSR) of highways is a five point standardized rating system for the condition of roads. A road is considered to be in "good" condition by the U.S. Department of Transportation if the PSR is between 3.5 and 5.0; "fair" condition is between 2.0 and 3.5 (except for interstate highways which vary from 2.5 to 3.5); and "deteriorated" condition means the PSR is less than 2.0 (except for interstates which are less than 2.5). In general, it can be argued that roads in the "good" category require little if any repair or resurfacing activity. Roads in the "fair" category usually need repairs, such as typical maintenance activities (patching, crack sealing, seal coating, pot hole filling, minor resurfacing). And "deteriorated" roads require extensive reconstruction or resurfacing.

For purposes of calculating the PSR, ODOT selects a random sample of 3000 segments of highways in the state stratified by functional classification and by urban/rural designation. U.S. DOT recognizes four major functional classifications. PRINCIPAL ARTERIAL SYSTEMS are designed for long distance travel and serve the highest traffic volumes. There are three major categories within this functional classification: interstate highways; other freeways and expressways (for urban routes only); and other principal arterials (for rural and urban routes). MINOR ARTERIAL

SYSTEMS are designed for shorter distance and lower speed transportation and connect with and augment the principal arterial system. COLLECTOR SYSTEMS usually interconnect with the arterial systems and also include routes for local traffic movement. This classification is sub-divided, according to importance, into major and minor systems for rural routes. Finally, LOCAL STREET SYSTEMS include streets not on a higher system, but which provide access to such systems. PSR data are not collected under the state's Highway Performance and Monitoring System (HPMS) for the largest functional classification, the local street system. Therefore, the PSR on 19,492 miles of urban streets and 56,840 miles of rural roads is excluded from this report.

Table 6 is taken from the HPMS system of ODOT. Besides the PSR for each functional classification, the table includes data on daily vehicle miles traveled (DVMT), an indicator of system usage. From this table, over 95 percent of the urban highways and 80 percent of the rural highways under the HPMS system are in "fair" condition which would indicate need for maintenance and repair activities. Approximately one percent of both rural and urban highways are "deteriorated" and in need of reconstruction and major rehabilitation. However, this last figure is somewhat deceiving since over 80 percent of the deteriorated roads are on the urban interstate highway system and almost half of the rural deteriorated roads are on the interstate system. The deteriorated portion of the entire interstate system carries 7,890,000 DVMT which accounts for 17 percent of all interstate highway traffic and seven percent of total HPMS highway traffic.

Compared with 1978 PSR data, the condition of the roads and

Table 6

Pavement Condition of Ohio's Highways
by Functional Classification, 1981

	Rural					Urban				
	DVMT	% DVMT	No. Miles	Percent	Percent State Responsibility	DVMT	% DVMT	No. Miles	Percent	Percent State Responsibility
Interstate						Interstate				
Good	2,561	15.3	166	18.8		4,122	14.5	113	17.2	
Fair	11,332	67.8	545	61.9		19,217	67.6	448	66.9	
Deteriorated	2,814	16.8	170	19.3		5,089	17.9	104	15.9	
	16,706		881	100.0	100.0	28,428		654	100.0	100.0
Other Principal Arterials						Other Freeways and Expressways				
Good	1,646	17.2	230	14.9		1,044	17.4	46	13.8	
Fair	7,338	76.6	1,202	78.0		4,566	76.1	267	79.5	
Deteriorated	592	6.2	109	7.1		396	6.6	22	6.7	
	9,575		1,541	100.0	100.0	6,000		336	100.0	100.0
Minor Arterials						Other Principal Arterials				
Good	2,084	18.1	582	17.9		--	--	--	--	
Fair	9,082	79.0	2,612	80.4		23,082	100	1,967	100	
Deteriorated	326	2.8	56	1.7		5		0	0	
	11,492		3,250	100.0	100.0	23,087		1,967	100	77.1
Major Collectors						Minor Arterials				
Good	204	1.0	163	1.4		56	0.4	2	0.1	
Fair	20,213	99.0	11,646	98.6		14,165	99.6	2,623	99.9	
Deteriorated	0	0.0	0	0.0		0	0.0	0	0.0	
Unpaved								2	--	
	20,417		11,810	100.0	73.8	14,220		2,626	100.0	35.6
Minor Collectors						Collector				
Good	117	2.7	140	1.9		4	0.1	2	0.1	
Fair	3,716	87.3	6,471	85.9		5,438	99.9	3,894	99.9	
Deteriorated	13	0.3	27	0.3		0	--	--	--	
Unpaved	412	9.7	893	11.9		--	--	1	0.0	
	4,259		7,530	100.0	17.7	5,442		3,897	100.0	4.9

Table 6
(contd.)

Pavement Condition of Ohio's Highways
by Functional Classification, 1981

	Rural					Urban				
	DVMT	% DVMT	No. Miles	Percent	Percent State Responsibility	DVMT	% DVMT	No. Miles	Percent	Percent State Responsibility
Local										
Good	NA	NA	NA	NA		NA	NA	NA	NA	
Fair	NA	NA	NA	NA		NA	NA	NA	NA	
Deteriorated	NA	NA	NA	NA		NA	NA	NA	NA	
			56,840		0.0			19,492		0.0

Condition Rating: Good = PSR of 3.5 or greater; Fair = PSR of 2.0 to 3.4; Deteriorated = PSR of 1.9 or less.

Source: Computer print-out from ODOT, Bureau of Technical Services, July 1983.

highways covered under HPMS has not changed substantially, except for two categories: (1) In 1978, 28.6 percent of the rural interstate system was in "deteriorated" condition; by 1981 it had been reduced to 19.3 percent. (2) In 1978, 11.3 percent of rural minor arterials were considered to be in "good" condition; by 1981, that figure increased to 17.9 percent. For other categories minute changes in ratings were recorded between 1978 and 1981.

Expenditures.

Maintenance expenditures on Ohio's state-owned highways have increased steadily since FY74 in current dollars (Ohio's fiscal year begins July 1 and ends June 30). In FY74, Ohio spent $36 million for maintenance; by FY82 maintenance appropriations exceeded $85 million, of which the state's own force spent $55 million, and $31.2 million were let in contracts (Table 7). According to the state's executive budget for the FY83-FY85 biennium, maintenance outlays for own-force work were to have been $56.3 million in FY83 -- representing a small increase over FY82 -- and then were budgeted at $59.2 million in FY84 and $61.8 million in FY85.

Although the increase in maintenance outlays between 1974 and 1982 was 136 percent in current dollars, in constant dollars the increase in maintenance outlays was not impressive. Using the U.S. Department of Transportation's maintenance cost deflator for the nation, the increase amounted to only 17 percent in the eight years, increasing from $73.7 million (1982 dollars) in 1974 to $86.2 million (1982 dollars) in 1982.

Capital improvements between FY74 and FY81 remained at a

Table 7

Capital and Maintenance Expenditures
for Ohio's State-Owned Highways
(millions of current dollars)

	Maintenance (own force)	Maintenance Contracts	Total Maintenance	Capital Improvement
1974[1]	$36.0	--	$36.0	$360.6
1975[1]	45.0	--	45.0	348.5
1976[1]	49.4	--	49.4	395.4
1977[2]	62.6	--	62.6	363.2
1978[2]	40.7	$25.4	66.1	346.0
1979[2]	39.7	29.6	69.3	430.4
1980[2]	45.2	16.6	61.8	307.9
1981[2]	48.9	28.8	77.7	325.7
1982[2]	55.0	31.2	86.2	627.7
1983[3]	56.3	NA	NA	594.3
1984[3]	59.3	NA	NA	768.8
1985[3]	61.8	NA	NA	743.8

[1]Actual expenditures; accounts closed, from Ohio DOT, Financial and Statistical Report, Fiscal Year 1982.

[2]Appropriation; some accounts are still open, from same source as Footnote 1.

[3]Requests as presented in The State of Ohio's Executive Budget for the biennium July 1, 1983, to June 30, 1985, prepared by The Office of Budget and Management.

fairly steady level of around $360 million (current dollars) per annum. In FY82 over $600 million were appropriated for capital improvements, and in FY83 $594 million were appropriated. Budgetary requests for FY84 increased to $768 million, a 29.4 percent increase over FY83 appropriations, and for FY85 the request was $743 million.

The next two sections on "Capital Needs" and "Operations and Maintenance Needs" for Ohio's highways are derived primarily from an ODOT "needs" study entitled OHIO STATE TRANSPORTATION PROGRAM. All projections and expenditure data are presented in the needs study in constant 1980 dollars. They are reproduced here in the same form. However, in order to make estimates of the "gap" (i.e., unfinanced needs) comparable to those of other infrastructural activities in this report, the next section in this chapter on "Expenditures and Needs" convert all data to 1982 dollars.

Capital Needs.

This section of the report is sub-divided into four major sections, each concerned with a different part of the state's highway system: (1) Primary system; (2) Interstate system; (3) Urban ('U') system; and (4) bridges. Because data for the non-state owned roads and highways are not kept at the state level, the needs estimates discussed below must be viewed with caution. Capital needs estimates are reported here only for parts of the federal aid portion of the state's highways (primary, interstate, urban) since the Federal Aid Secondary system and local roads were

excluded from ODOT's needs studies. However, estimates are presented for operations and maintenance costs of the entire 120,000 mile statewide system, including secondary and local roads in the next section.

Primary System. Of the 19,000 miles of highway for which the state is responsible, 6,771 miles are on the Federal Aid Primary system, carrying 40 percent of state highway traffic. A 1980 ODOT study estimated needs for FY81-85 at $482.7 million (Table 8). This needs estimate (in 1980 dollars) includes only already programmed projects, as do the projections for beyond 1985. The FY81-FY85 estimate requires $113.2 million for the state's share, $25.6 million for the local share, and $343.9 million for the federal share. For programmed projects beyond FY85, over $1.9 billion are needed. Thus, for programmed projects, a $2.45 billion needs estimate was derived in the ODOT study for FY81 and beyond.

TABLE 8: Cost Estimates for the Primary System
(thousands of 1980 dollars)

FY	Federal Primary	Other	State	Local	TOTAL
81-85	$322,600	$21,300	$113,200	$25,600	$482,700
Beyond 1985 (1)	1,434,500		504,000	26,500	1,965,000
TOTAL	$1,757,100	$21,300	$617,200	$52,100	$2,447,700

(1) These projects and all post-1985 estimates refer to what ODOT considers to be "needed" without regard to financial constraints. Hence, "post-1985" figures refer to needs with no concern for any particular "ending" date.

SOURCE: ODOT, OHIO STATE TRANSPORTATION PROGRAM: FEDERAL AID PRIMARY SYSTEM, February 1981.

If all projects, programmed as well as non-programmed, are

included, the picture worsens. On Ohio's Primary system 1,900 miles are currently designated as freeways -- defined as limited access, divided highways. Only 176 miles of the freeways meet this definition of freeway; and 1,013 miles are classified as divided but with only partial access control. Thus, to complete the remaining 711 miles and to upgrade the 1,013 miles to limited access, ODOT estimates that it would cost over $8.8 billion. Between 1981 and 1985 34 miles of freeway would be constructed costing $188.1 million, leaving over $1.255 billion in programmed projects and $7.426 billion in other needed work (i.e., non-programmed projects) that would need to be completed after 1985 -- assuming that necessary funding becomes available.

TABLE 9: Designated Freeway Portion of Ohio's Federal Aid Primary System

Type	Miles	Improvement Needed	Cost to Improve (1980 Dollars)
Freeways	176	Safety Upgrade	$ 99,000,000
Divided Highways (Partial Limited Access)	1,013	Upgrade to Freeway	4,500,000,000
		Safety Upgrade	570,000,000
Other Highways (No Access Control)	711	Construct Freeway	3,700,000,000
TOTAL	1,900		$8,869,000,000

SOURCE: ODOT, OHIO STATE TRANSPORTATION PROGRAM: FEDERAL AID PRIMARY HIGHWAY SYSTEM, February 1981.

The remaining 4,871 miles on the Primary system are designated as non-freeways. The costs of widening 1,204 miles of mostly two-lane roads to handle increased projected traffic are $2.7

billion plus another $294 million to expand 20 foot two-lane roads to the required 24 foot width. In addition to those estimates, ODOT estimates that in order to upgrade the non-freeway Primary system so that it would comply with safety standards (e.g., guard rails, sign posts, steep slopes, lateral clearance for hazardous objects), costs would be $2.74 billion. The total costs for these projects exceed $5.7 billion, of which only $125.2 million are programmed to be spent between FY81 and FY85 and $673.1 million are on the programmed projects list after FY85. The remainder, $4.9 billion, is needed according to these estimates, but as of yet not programmed.

Urban ('M') System. Fifteen percent of state highway traffic is carried over the 7,280 miles of the Federal Aid Urban System. Although in 1980 the state had over $700 million in active projects on the books, the $348.8 million needs estimates for FY81-FY85 presented in Table 10 only include those projects likely to be ready for construction and likely to be financed. Furthermore, the state deactivated $235 million in projects as of June 1980 when "they had to be cancelled or suspended for lack of adequate financing capability at all levels, caused by high inflation, reduced revenue and other factors." Thus, if the deactivated projects ($253 million) are combined with those that were active but not listed in the 1981-85 "probable program" ($700 million - $348.7 million = $351.3 million), an estimate of needs for the post 1985 period should amount to approximately $586 million.

TABLE 10: Probable 1981-85 Urban System Programs

FY	Federal	Local	State	TOTAL
81	$76,400,000	$22,490,000	$ 450,000	$ 99,380,000
82	65,000,000	20,090,000	280,000	85,370,000
83	45,210,000	14,380,000	1,220,000	60,810,000
84	46,120,000	15,530,000	630,000	62,350,000
85	30,050,000	10,570,000	240,000	40,860,000
TOTAL	$262,890,000	$83,060,000	$2,820,000	$348,770,000

SOURCE: ODOT, OHIO STATE TRANSPORTATION PROGRAM: FEDERAL AID URBAN HIGHWAY SYSTEM, February 1981.

Interstate Highways. Approximately $3.9 billion have been spent as of 1981 to complete 1,531 miles of interstate highway in the state, excluding the Turnpike. Less than two percent of the system, 37 miles, are yet to be completed. The estimated cost of completing the system exceeds $783 million (Table 11). Six new or rebuilt interchanges and seven sections of additional pavement lanes (both types of work are considered to be reconstruction) require an additional $156 million. Finally, safety upgrading, resurfacing, roadside rest area modernization, and "other categories" are estimated to cost over $380 million. The total needs figure for the interstate system is $1.3 billion. Due to constraints on federal and state financial obligations, ODOT estimates that between FY81 and FY86 $823.7 million should be spent on the interstate system in order to address projected needs, leaving $432.7 million in unmet needs for the post-1986 period, which extends to 1990.

Bridges. There are 14,327 bridges on the state highway system. Each bridge's serviceability is rated annually on a scale of 0 to 100. Generally, a bridge needs to be replaced if the

Table II

Needs for the
Interstate Highway System

	Miles	Restoration	Projects 1981-1986 New Construction	Safety Modernization	Total (1980 Dollars)
New Construction, Gap Closure	27.2		569,700,000		$569,700,000
Major Reconstruction	20.3	4,300,000	79,700,000		84,000,000
Safety Upgrading	88.4	23,800,000		58,200,000	82,000,000
Rest Areas				25,500,000	25,500,000
Resurfacing	460	62,500,000			62,500,000
TOTAL	135.9	90,600,000	649,400,000	83,700,000	823,700,000
			Post-1986		
New Construction, Gap Closure	15.1		213,900,000		213,900,000
Major Reconstruction	21.6	2,000,000	69,900,000		71,900,000
Safety Upgrading	51.0	11,900,000		32,900,000	44,800,000
Resurfacing		102,100,000			102,100,000
TOTAL	87.7	116,000,000	283,800,000	32,900,000	432,700,000
	TOTAL	1981 - 1986 + Beyond 1986			
	223.6	$206,600,000	$933,200,000	$116,600,000	$1,256,400,000

Source: ODOT, Ohio State Transportation Program: Interstate Highway System (February 1981).

sufficency rating is less than 50; if it is between 50 and 80 some rehabilitation and repair work are needed. As of October 1980, 721 bridges fell below the 50 percent mark and 4,598 were between the 50 and 80 percent range (Table 12). Cost estimates were developed for only the state-controlled or ODOT portion of the bridge network (11,634 bridges). It would cost approximately $600 million to replace the 605 most dilapidated bridges (i.e., those with sufficiency ratings less than 50). Further, ODOT estimated it would cost approximately $128 million over a five year period (1981-85) to replace bridges eligible for federal Bridge Replacement (BR) funds. In its 1980 needs study, ODOT expected to receive only $60 million in BR funds for the five year period and to spend only $250 million for the total bridge program. As is discussed later, however, BR funds exceeded annual requirements.

Operations and Maintenance Needs.

The previous section on capital needs usually included some role for federal participation. Operations and Maintenance (O & M) activities are wholly dependent upon state-generated funds. In order to operate and maintain the 19,000 miles of state-owned highways at levels considered by ODOT in its 1981 State Transportation Program to be "minimal and reasonable when compared to nationwide standards", O & M outlays should be augmented by almost 80 percent to meet projected needs. As presented in Table 13, ODOT estimated O & M needs at $425.5 million (1980 dollars) each year, compared with 1980 outlays of only $237.8 million. The major categories of unmet needs were: (1) personal services (or personnel working for ODOT), which in 1980 amounted to 6,827

Table 12

COUNT DISTRIBUTION FOR BRIDGES ON THE STATE HIGHWAY SYSTEM

LISTED BY OWNERSHIP (Maintenance Responsibility), ESTIMATED REMAINING LIFE AND DEFICIENT BY SUFFICIENCY
as of OCTOBER 1980

NOTE: Estimates of remaining life are the judgments of the applicable State District Bridge Engineers or Ohio Turnpike Engineers.
All Bridges 10' or more in overall length over or carrying an Interstate, U.S., or State Route are counted

	OWNING AGENCY (Maintaining Agency) *Combinations include State-City, State-County, County-County, City-County, etc.									
ESTIMATED REMAINING LIFE IN YEARS	ODOT	OHIO TURNPIKE	COUNTY & TOWNSHIP	MUNICIPAL	FEDERAL	RAILROAD	PRIVATE	* COMBINATION	UNKNOWN	SYSTEM TOTALS
Less than 5	316	0	34	2	0	9	0	4	0	365
10	1,172	20	168	6	0	71	4	12	0	1,453
20	2,279	0	271	35	2	103	13	17	0	2,720
30	2,367	5	274	66	2	51	7	19	0	2,791
40	4,234	2	374	202	2	79	24	25	0	4,942
50	1,086	1	107	27	0	9	6	13	0	1,249
60	114	0	12	2	0	0	0	3	0	131
70	21	0	3	1	0	0	0	0	0	25
80	39	602	2	0	0	1	0	0	0	644
90	6	0	0	0	0	1	0	0	0	7
Totals	11,634	630	1,245	341	6	324	54	93	0	14,327
Deficient By Sufficiency										
Less than 50%	605	2	92	2	0	10	1	9	0	721
50 thru 80%	3,660	275	526	86	1	16	4	30	0	4,598
Totals	4,265	277	618	88	1	26	5	39	0	5,319

Source: ODOT, Ohio State Transportation Program: Bridges (February 1981).

Table 13

Highway Operations and Maintenance Expenditures and "Needs"

(O & M -- 100% State Funds)

	Actual FY 80	Approx. FY 81	Appropri-tion for FY 82	1980 Dollars Desired
Personal Services[1]	$133,129,000	$144,319,000	$154,625,000	$192,000,000
Supplies & Maintenance Material	47,430,000	53,515,000	56,004,000	60,000,000
New & Replacement Equipment[2]	2,653,000	2,032,000	2,840,000	3,995,000
Research	1,200,000	1,200,000		1,200,000
Maintenance Contract: Bridge Paint & Repair[3]	7,584,000	7,687,000	8,000,000	10,000,000
Interstate Maintenance[4]	4,411,000	5,400,000	6,500,000	6,000,000
Spot Patch, Slips, etc.[5]	2,634,000	3,931,000	5,040,000	17,000,000
Guard Rail[6]	214,000	2,470,000	2,750,000	7,600,000
Pavement Making[7]	1,927,000	3,800,000	2,710,000	4,500,000
Signing & Lighting	1,927,000	3,698,000	2,710,000	4,500,000
Raised Pavement Markers	229,000	2,000,000	1,800,000	3,000,000
Roadside Maintenance[8]	204,000	520,000	1,000,000	1,884,000
Resurfacing[9]	25,429,000	35,002,000	92,101,000	99,786,000
Replacement of Heavy Capital Equipment[10]	6,447,000	7,860,000	8,400,000	8,300,000
Capital Improvements to Lands & Buildings[11]	3,772,000	5,228,000	5,000,000	5,775,000
TOTAL	$237,804,000	$278,662,000	$350,130,000	$425,540,000

Highway Operations and
Maintenance Expenditures
and "Needs"
(Page 2)

[1]

	# of Employees			
	Admin.	Plan. & Ser.	Const. & Oper.	TOTAL
Nov. '75	679	1,388	6,214	8,281
Nov. '80	648	994	5,185	6,827
Desired	678	1,084	6,465	8,227

Exp. for FY 80:	$133,129,000
(approx.) for FY 81:	$144,319,000
FY 81 "Desired":	$192,000,000

[2]"Desired" based on 6 year replacement cycle for 1,500 autos and 1,750 vans & trucks; also, replacement cycle for communications equipment at 10 years as recommended by FCC rather than current 15 years.

[3]Assumes doubling current rate of painting 366 of the 7,500 bridges on Rural State Highway System that need painted every 10 years (there are 11,634 bridges on this system)

[4]Performs maintenance within cities of 100,000 or more

[5]Estimated that 5% of system must be improved annually (spot patching mainly on secondary system) which is badly needed:

Spot patch, seals, cracks & joints	$ 7,000,000
Slides & slips	6,000,000
Drainage and Ditch Repair	2,000,000
Fence Replacement	2,000,000
	$17,000,000

[6]8.96 million feet are substandard.

Assume 35 year cycle for replacement or 267,745 linear feet per year	$2,700,000
Upgrade 448,000 linear feet per year	4,500,000
Assume 4 year paint cycle for non-galvanized guardrails or 943,500 linear feet per year	400,000
	$7,600,000

[7]Assumes 12,000 miles of center line, 5,000 miles of lane line, 17,000 miles of edge line.

[8]Erosion Control, Seeding, Sodding, Fertilizing, Mowing and Herbicidal Spraying.

Highway Operations and
Maintenance Expenditures
and "Needs"
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[9]Assume a 10-year resurfacing cycle:

Interstate:	1,250 miles x 1/10 x $132,500/mile =	$16,562,500
Four lane:	1,350 miles x 1/10 x $102,250/mile =	13,803,750
Two lane:	14,800 miles x 1/10 x $41,500/mile =	61,420,000
Urban:	1,600 miles x 1/10 x $50,000/mile =	8,000,000
(Excludes federal 3R allocation)		$99,786,000

[10]656 pieces of heavy equipment have depreciated to a point where they have no book value; estimated replacement cost = $12 million

[11]22 ODOT garages (of 326 buildings) are older than 40 years.
Assume 3 county garages replaced/year = $3,400,000
plus other building replairs/replacements.

Source: State of Ohio', Department of Transportation, Ohio State Transportation Program: State Highway Operations and Maintenance (February 1981); data on Appropriations for FY82 are taken from ODOT, Financial and Statistical Report, Fiscal Year 1982.

employees at a cost of $133 million -- figures that should be increased to 8,227 employees costing $192 million; (2) spot patchwork, which should be increased to $17 million (an eight-fold increase over 1980 outlays); and (3) resurfacing, which ODOT believes should be at $99.8 million rather than the 1980 level of $25.4 million. It should be noted that the 1982 highway appropriation for resurfacing was $92.1 million, much closer to the $99.8 million which were deemed necessary. However, the 1982 figures are in current dollars. If standardized in 1982 dollars, the gap between 1982 resurfacing appropriations and annual "needs" would amount to $24.6 million.

Each "desired" expenditure level of the categories in Table 13 is predicated upon the assumptions that appear in the footnotes and which constitute "minimal and reasonable" standards. If those same standards were applied to the remaining 91,000 miles of roads, streets, and highways not owned by the state, the "needs" figure would be staggering. By using those standards, O & M needs were calculated for non-state roads to approximate $1.9 billion. This figure is admittedly on the high side because the standards for state roads may not be appropriate for local, less traveled roads. But, according to some ODOT officials, it is probably not significantly overestimated.

Total O & M highway "needs" of both state and local governmental units exceed $2.3 billion (1980 dollars) per year. The $2.3 billion estimate is shocking when compared with the fact that total state and local highway expenditures financed from own source revenues in FY81 amounted to only $915.6 million.

Expenditures and Needs.

Most of the needs cited in this section were developed in 1980 and 1981 for only the urban, interstate, primary and bridge systems. A comparison of those needs on an annualized basis with obligations made by ODOT results in a rough estimate of unmet or backlog needs between FY81 and FY83. A discussion of the "gap" between projected expenditures and needs follows the backlog estimates.

In order to calculate backlog needs, Table 14 presents the amount of funds obligated by federal fund type. Needs on the Primary system for programmed projects only amount to $96.5 million per year (see Table 8), or $289.5 for FY81 through FY83. Obligations amounted to only $215 million for that same period, resulting in a three year backlog of programmed projects of $74.5 million. Needs on the Urban system totalled $245.6 million for FY81 through FY83, while obligations amounted to $150.1 million, resulting in a backlog of $95.5 million in needs for the three year period. Interstate highway needs average $120.6 million per year, or $361.8 million for FY81 through FY83. Obligations for the Interstate system during that period amounted to $356.1 million, resulting in a negligible backlog ($5.7 million). Finally, average annual bridge needs for eligible Bridge Replacement funds exceeded $25 million per year. Obligations for FY81 through FY83 amounted to $112 million, resulting in a three year "surplus" (i.e., projected expenditures exceed needs) of $47 million.

As presented in Table 13, state O & M needs are $425.5 million (1980 dollars). In order to calculate the FY81 through FY83 O & M backlog (state portion only), this figure was corrected for

TABLE 14

Federal and Non-Federal Funds for Highways
by Federal Fund Type
(Millions of Current Dollars)

	FY81		FY82		FY83		
FEDERAL FUND TYPE	Federal Funds Obligated	Estimated Matching Funds	Federal Funds Obligated	Estimated Matching Funds	Federal Funds Obligated	Estimated Matching Funds	Fund Balance July 1, 1983
Interstate	$44.1	$ 5.7	$126.0	$16.4	$24.4	$ 3.2	$67.2
Interstate 4R	15.1	2.0	24.6	3.2	80.9	10.5	7.8
Interstate Transfer	17.6	2.3	9.6	1.2	14.8	1.9	23.7
Urban	41.5	15.0	38.4	13.8	30.4	11.0	88.4
Primary	62.3	22.5	32.8	11.8	62.9	22.7	38.4
Secondary	27.5	9.9	15.5	5.6	20.1	7.2	0.5
Bridge Replacement	21.1	5.8	17.8	4.9	49.0	13.4	23.7

Source: Al Weese, Assistant Deputy Director, Program Development Administration, Ohio Department of Transportation, based on Monthly Reports from the Federal Highway Administration (personal communication).

inflation so that it could be compared with O & M outlays in constant 1982 dollars. These outlays amounted to $288.9 million in FY81, $334.0 million in FY82, and $355.3 million in FY83. Subtracting each figure from the revised (inflated) O & M needs figure of $498 million (1982 dollars) results in annual deficits of $209.1 million, $164.0 million, and $142.7 million. The state's O & M backlog, then, totals $515.7 million (1982 dollars) for the three year period. The local O & M backlog is estimated as the difference between the $1.9 billion "needs" figure and actual O & M outlays in FY81 of $215.9 million (calculated as the difference between total and capital outlays as reported in GOVERNMENTAL FINANCES in 1980-81). If the $1.9 billion are inflated to 1982 dollars ($2,223 million) and if O & M outlays increase at the same rate as he CPI (to $228.9 million), the annual gap would be $1,994.1 million (1982 dollars). Assuming the "gap" remained the same in FY82 and FY83 as it was in FY81, the local O & M backlog amounts to approximately $1,994.1 million (1982 dollars) per year, or $5,982.3 million for the three year period.

Total backlog needs for FY81 through FY83 for the primary, urban, interstate, and federal bridge programs totalled $128.7 million. After state O & M backlog needs of $515.8 million and local O & M backlog needs of $5,982.3 million are added, total highway and bridge backlog for FY81 through FY83 amounts to an astonishing $6,626.8 million (1982 dollars).

Projected expenditures for these same systems for FY84 and FY85 compared with anticipated needs leaves a future unfinanced "gap" of $4,239.7 million (1982 dollars) -- this will be discussed more fully in the last chapter. Therefore, the unfinanced needs

figure for highways and bridges for the five year period FY81 through FY85 exceeds an astronomically high figure of over $10 billion (1982 dollars).

MASS TRANSIT

The state of Ohio involved itself in mass transit in order to provide local matching funds for federal programs (primarily Section 3 and Section 5 of the Urban Mass Transportation Act which subsidizes capital and operating costs, respectively). The first state program began on July 1, 1973 when the Ohio Public Mass Transportation Grant Program went into effect providing aid for capital purposes. In 1977 the program expanded to allow subsidies for operating purposes as well. The Ohio Elderly and Handicapped Transit Fare Assistance Program provides funds to participating public transit systems so that fares might be reduced for handicapped and elderly riders. The state is also involved in providing part of the matching funds for small urban and rural transit systems.

Table 15 provides a summary of appropriations to the three above-mentioned programs from FY76 to FY82. Note in particular the state's declining support (in terms of dollars from the General Revenue Fund) since FY80, which accounts for the leveling off of expenditures in the last several years. This trend is projected to continue through FY83, but then FY84 and FY85 project very large increases especially through higher revenues for the Public Mass Transportation Grant Program (Table 16).

TABLE 15

Revised Appropriations for Mass Transit

	76	77	78	79	80	81	82
Expenditures							
Rural & Small Urban Transpor. Assistance	(1)	(1)	(1)	(1)	1.8	1.5	5.7
Public Mass Transpor. Grants	1.5	7.9	10.4	10.4	18.0	16.6	17.9
Elderly & Handicapped Transit Fare Assist.	0.9	1.1	2.0	1.9	2.4	2.3	2.5
Others	0.1	0.3	0.6	1.3	7.6	2.0	2.5
Total	2.5	9.3	13.0	13.6	29.8	22.4	28.6
Revenues							
General Revenue Fund	1.6	9.3	12.7	13.0	25.2	19.6	21.7
Urban Mass Transportation	0.7	0.0	0.2	0.5	4.1	2.5	6.6
Local Agencies	0.2	0.0	0.1	0.1	0.6	0.3	0.3
Total	2.5	9.3	13.0	13.6	29.8	22.4	28.6

(1) = item did not exist

Source: ODOT, Financial and Statistical Report (various years)

TABLE 16: Mass Transit Budget for FY83-FY85
(millions of dollars)

	FY83	FY84	FY85
EXPENDITURES			
Rural and Small Urban Transportation Assistance	$7.4	$3.3	$3.3
Public Mass Transportation Grant Program	16.2	28.8	29.3
Elderly and Handicapped Transit Fare Assistance	2.3	2.4	2.5
REVENUES			
General Revenue Fund	18.5	31.2	31.8
Highway Operating Budget (includes Federal funds)	7.4	3.3	3.3

SOURCE: EXECUTIVE BUDGET FOR THE BIENNIUM JULY 1,1983 TO JUNE 30,1985, prepared by the Office of Budget and Management.

The extent to which past and projected expenditures address the needs of the state's mass transit systems is contained in a 1981 ODOT report entitled OHIO STATE TRANSPORTATION PROGRAM: PUBLIC TRANSPORTATION FINANCING (March 1981). In that report capital and operating needs of the mass transit system for the biennium FY82 and FY83 exceeded $1.2 billion ($665.7 million in capital needs and $547.5 million in operating needs). The state's share, in order to address those needs, was projected to be $120.4 million (from Public Mass Transportation Grants). In fact, only $34.1 million were spent ($17.9 million in FY82 and $16.2 million in FY83), leaving a two-year unfinanced backlog of $86.3 million (1982 dollars).

Capital needs for FY84 and FY85 are forecast to be $229.0 million and $129.6 million (1982 dollars), respectively, while operating needs are forecast to be $294.1 million and $309.2 million (1982 dollars), respectively. The state's share of financing mass transit systems for FY84 and FY85 is budgeted at

$28.8 million and $29.3 million, or in 1982 dollars, $26.7 million and $25.7 million. If the state's share of total mass transit outlays represents 9.9 percent of total needs for the next two years (which is equivalent to the state's FY82-FY83 share according to the ODOT needs assessment), then projected expenditures by all levels of government should be $269.7 million in FY84 and $259.6 million in FY85 (1982 dollars). The difference between total capital and operating needs and estimated total outlays would result in unfinanced capital and operating needs of $253.4 million (1982 dollars) for FY84 and $179.2 million (1982 dollars) for FY85.

Therefore, combining the estimated two year backlog needs ($86.3 million) with the projected two year "gap" ($432.6 million) results in a four year "gap" estimate of $518.9 million (1982 dollars).

CHAPTER 3: AIRPORTS

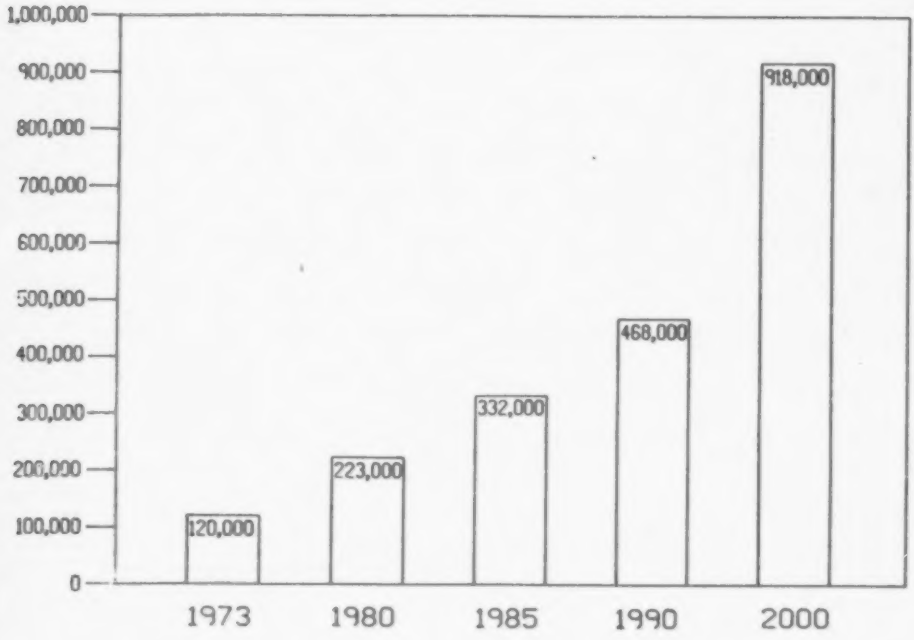
The state of Ohio has within its borders seven large or Class I airports serving seven of the largest metropolitan areas: Cleveland, Columbus, Dayton, Toledo, Akron, Canton, and Youngstown. The eighth, Cincinnati, is serviced by an airport in northern Kentucky and is therefore excluded from the discussion herein. Ohio also has 194 Class II and Class III airports. Class II airports handle excess traffic from Class I airports, while Class III airports are general aviation airports which serve commercial, instructional, agricultural, and recreational facilities. Finally, there are 576 Class IV or non-commercial (private) airports.

In 1974 a study for ODOT's Division of Aviation forecast passenger and commercial traffic through Ohio for the period 1973 to 2000. A 1983 study relied on those forecasts and made only minor modifications to them. Hence, the data below, derived essentially from a ten year old study, may not accurately portray traffic, especially since the devastating economic downturn in the late 1970's and early 1980's and the deregulation of the airline industry.

The study forecast cargo tonnage to almost double from 120,000 tons in 1973 to 223,000 tons in 1980, to double again by 1990 and to reach 918,000 tons by the year 2000 (see Table 17). Passenger movement was not predicted to increase at the rate of commercial traffic. Yet, significant increases were forecast for Ohio

Table 17

Forecast of Air Cargo Tonnage
Through Ohio's Seven Major
Airports, 1973 to 2000



airports. Air passenger traffic was predicted to grow from 6.1 million persons in 1973 to 10.2 million in 1980 to 24.8 million passengers by the year 2000 (Table 18).

Physical Condition.

According to a 1983 memorandum from ODOT, officials state that the general condition of Ohio's airports is good. No new airports are needed, but maintenance and expansion of existing airports are required. A reason for the good condition of county airport runways is the state's program which makes available $550,000 per year for runway overlays. Between 1980 and 1983, 43 of the 61 county airports have been repaved at a cost of $1.95 million to the state and $2.09 million to the local airport authorities.

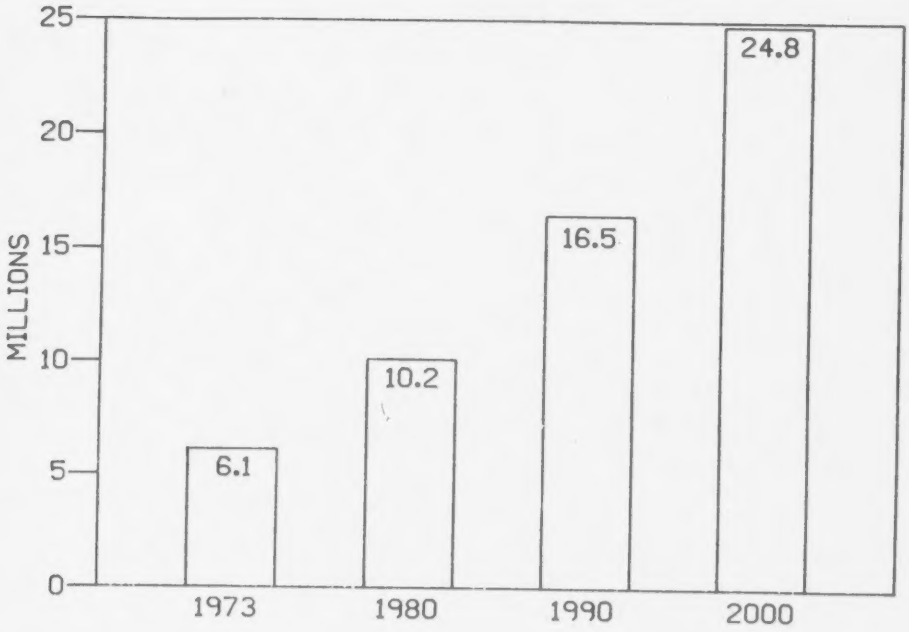
Expenditures and Revenues.

Most owners and operators of Ohio's public airports (cities, counties, airport authorities) have the authority to acquire, construct, and operate airports. They also may set fees at the airports and use the right of eminent domain. However, they cannot levy specific taxes for airport operations.

Funds for airport improvement come primarily from General Obligation bonds, revenue bonds, cash contributions (or donations from individuals and industries), in-kind contributions, and grants from the federal and local governments. G.O. Bonds, considered self-supporting much like revenue bonds, are used primarily by the Class I airports. They usually are sold by the city and frequently

Table 18

Ohio Air Passenger
Forecast 1973 to 2000



are incorporated into the city's capital improvement plans. Revenue bonds are only used occasionally and by the Class I airports exclusively. Landing and parking fees service this form of debt. Federal grants, primarily through the Airport Development Aid Program (ADAP), have been substantial. Between 1974 and 1983 federal grants (primarily ADAP) have funded approximately $112.1 million in Ohio airport projects. Prior to 1973, ADAP funded over $41 million in projects. Local contributions for airports with low activity are primarily sporadic lump-sum payments usually for specific purposes.

Operations and Maintenance.

Operating revenues and public and private subsidies cover the O & M costs of airports. In fact, the low activity airports rely almost entirely on subsidies, such as contributions of cash, labor, and materials by flying clubs, individual flyers and aircraft-using businesses. Most major airports and some Class II airports receive regular appropriations from county or municipal general funds. According to estimates by ODOT officials, approximately $34 million were spent from these general funds in FY83. Further, most local airports are provided snow plowing, grass moving and other services by the local and county highway departments and other governmental agencies.

Forecasts.

ODOT estimates that the long-term viability of Ohio's airport

system depends in large part on increasing airport capacity, upgrading levels of service, and providing air access to remote locations. In the 1974 study, the state estimated that over $76 million needed to be spent for the 1975-85 period, of which the state should provide $32 million or $3.2 million per year. Long-range needs (1985 to 2000) would cost the state approximately $3.24 million per year. These "needs" have been slightly revised in the 1983 study (Table 19). Even though state-supported needs are now forecasted to be $3.1 million per year, the state currently provides $550,000 per year. The difference of $2.6 million is unfinanced. However, no comprehensive study exists that would describe or predict the consequences of not meeting the needs contained in those reports. Therefore, the short-term and long-term effects of the lack of "needed" funding are unknown.

Table 19

Annual Costs of Recommended Aviation Programs

Program	Cost
Capital Improvement Airport Construction (maximum grant $100,000 per airport, twenty airports per year)	$ 2,000,000
Aid to heliports (maximum grant $25,000 per heliport, ten heliports per year)	250,000
Special improvements (safety, etc., maximum grant $50,000, five projects per year)	250,000
Airport pavement overlay program (maximum grant $50,000 per project, eleven projects per year)	550,000*
Promotion of passenger air service, such as commuter service, etc.	50,000
Total	$ 3,100,000

*This is the only item currently funded by the Legislature.

CHAPTER 4: RAILROADS

According to the OHIO STATE RAIL PLAN UPDATE, 1982-83, Ohio's rail network "with more track mileage per square mile than any other state in the nation, is comprised of over 7000 route miles of railroad track over which 28 railroad companies operate" (p. 13). Ohio, like most states, does not own its own railroad or subsidize them (except for a few light density lines which are financed from a federal program), rendering collection of data on condition, revenues and expenditures difficult.

Of the 7,140 route miles of track in the state (excluding switching and terminal companies), over 91 percent are owned by four Class I carriers: Conrail, Chessie, Norfolk and Western, and Detroit, Toledo and Ironton. Although the rail network and inter-modal transportation facilities in the state currently are extensive, between 1973 and 1978 over 700 miles of light density lines were abandoned and between 1980 and 1981 over 300 miles of line were officially abandoned. Indeed, like most Midwestern states, the size of the rail system is shrinking.

Data on commodity movements in Ohio for 1980 indicated that over 64 percent of the total were classified as Metallic Ores, Coal, and Primary Metal Products (Table 20). Approximately 2.1 million carloads originated or terminated in Ohio transporting over 150 million tons of commodities. In comparison with other transport modes, railroads transported less total tonnage in 1980 than motor carriers -- motor carriers carried 47 percent of tons

Table 20

RAIL COMMODITY MOVEMENTS IN OHIO
(tons)

STCC CODE	COMMODITY	INBOUND	% I/B	OUTBOUND	% O/B	INTRAST.	% I/S	TOTAL	% TOTAL
01	Farm Products	453,700	0.6	6,588,000	13.0	185,400	1.0	7,227,100	4.8
10	Metallic Ores	5,201,200	6.5	17,040,700	33.7	4,636,400	23.8	26,878,300	17.9
11	Coal	45,872,700	57.4	2,467,500	4.9	5,400,500	27.8	53,740,700	35.8
14	Non-Metallic Minerals	2,606,400	3.3	3,007,500	5.9	1,197,400	6.2	6,811,300	4.5
20	Food or Kindred Products	2,432,400	3.0	2,795,400	5.5	307,300	1.6	5,535,100	3.7
24	Lumber or Wood Products	779,700	1.0	60,900	0.1	0	0	840,600	0.6
26	Pulp, Paper, or Allied Products	2,420,200	3.0	702,000	1.4	48,700	0.3	3,170,900	2.1
28	Chemicals, or Allied Products	4,178,700	5.2	2,196,900	4.3	454,000	2.3	6,829,600	4.6
29	Petroleum or Coal Products	1,782,100	2.2	2,471,200	4.9	673,200	3.5	4,926,500	3.3
32	Clay, Contrete, Glass or Stone Products	1,765,700	2.2	1,939,000	3.8	68,900	0.4	3,773,600	2.5
33	Primary Metal Products	6,774,500	8.5	4,818,600	9.5	4,299,500	22.1	15,892,600	10.6
37	Transportation Equipment	1,129,700	1.4	2,442,100	4.8	196,500	1.0	3,768,300	2.5
40	Waste or Scrap Materials	3,371,200	4.2	1,641,300	3.2	1,889,800	9.7	6,902,300	4.6
46	Miscellaneous Mixed Shipments	550,800	.7	961,100	1.9	0	0	1,511,900	1.0
--	Other	649,600	.8	1,511,000	3.0	90,700	0.5	2,251,300	1.5
TOTALS		79,968,600	100.0	50,643,200	100.0	19,448,300	100.0	150,060,100	100.0

* Source: ICC 1% Waybill Sample, 1980, Ohio Rail Transportation Authority, Ohio State Rail Plan Update, 1982-83.

shipped -- but rails were responsible for over 48 percent of ton-miles (calculated as the product of tons hauled and miles travelled). This suggests that rails are preferable for long haul shipping, an inference supported by the fact that average rail haul in Ohio was 378 miles in 1980.

Expenditures and "Needs".

Little information exists on capital and operating outlays and "needs" of Ohio's rail system. Most information (e.g., operating revenues and expenditures) does not separate Ohio's share from the railroad company's total system. However, Conrail and Norfolk and Western did estimate their 1983 capital outlays for the state in letters to the Ohio Rail Transportation Authority. Conrail maintains that approximately $33.5 million would be spent in Ohio for replacement of ties, tracks, and for other capital projects. Norfolk and Western (N&W) has budgeted $42 million in 1983 for capital projects on the entire system. Approximately 24 percent (or $10 million) would probably be spent in Ohio since 24 percent of N&W track miles are in Ohio. A 1980 ODOT study estimated maintenance and capital improvement needs of all the carriers serving the state. The report stated that deferred maintenance "needs" exceeded $78 million and deferred capital improvement "needs" were $169 million, for total deferred "needs" of almost $248 million. ODOT projected that future needs would exceed $670 million, with maintenance "needs" climbing to $234 million and capital "needs" reaching $436 million.

Because of the paucity of available data on the railroads, little can be concluded about the railroads' potential in

addressing the needs of the state's rail system. Finally, no "gap" could be calculated between anticipated revenues and needs.

CHAPTER 5: SEWER COLLECTION AND TREATMENT SYSTEMS

There are approximately 800 wastewater treatment plants in the state of Ohio owned and operated by municipalities, counties, and special districts. Because of the Clean Water Act and the EPA grants for wastewater treatment mandated by the Federal Water Pollution Control Act Amendments (P.L. 92-500), data are collected at the state level by the Ohio Environmental Protection Agency (OhioEPA). Most of the data, however, refer to the "needs" of wastewater treatment systems in terms of meeting the fishable/swimmable goals and other regulations of federal legislation. Data are unavailable at the state level on the physical condition of the wastewater systems. Therefore, "needs", as discussed in this report, do not refer to replacement or rehabilitation of existing wastewater systems as a result of age, physical deterioration, etc.; that is, they do not refer to capital projects that are ineligible for EPA grants (e.g., sewer line replacement, valve and pump repair). "Needs" only refer to expenditures which are both required to meet federal regulations and eligible for EPA grants (e.g., upgrading sewer treatment plants).

Operations, Maintenance, and Capital Expenditures.

Each year owners of wastewater treatment systems submit reports to the state's Auditor's Office. Since 1976, approximately 500 of the 800 wastewater treatment systems have provided usable

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data to the state on capital, O & M, personnel, and other costs. Table 21 shows the rapid growth (in current dollars) in almost all categories between 1976 and the latest available year, 1980. Personnel costs have escalated the least in the five year period, climbing almost 40 percent; O & M costs increased over 70 percent; interest on debt increased by almost 90 percent; and capital costs went up by 60 percent mostly as a result of federal laws, EPA grants, and state participation. In comparison, the Consumer Price Index increased 44.9 percent between 1976 and 1980. Non-local (i.e., state and federal) participation alone rose from $67.9 million in 1976 to $112.4 million in 1980, an increase of over 65 percent. (EPA-approved and mandated capital improvements are financed -- in most cases -- on a 75/25 cost sharing basis). Total capital outlays for all 800 wastewater treatment systems amounted to $521 million in FY81, $509.6 million in FY80, and $417.3 million in FY79, according to GOVERNMENTAL FINANCES.

Even with what appears to be substantial federal participation, the EPA Needs Survey for 1982 indicates that in order to meet the "needs" of six categories of wastewater treatment systems, federal and local expenditures must be augmented immediately and substantially. The magnitude of the "needs" is staggering: unmet needs, or Backlog Needs, exceeded $11 billion for the state in 1982. The "needs" figures reported herein refer only to publicly owned wastewater conveyance and treatment works, and excludes individual systems, privately owned facilities and federally owned facilities. "Needs" are divided into six major categories:

Category I -- Secondary Treatment;

Table 21

Annual Expenditures (1976-1980)
on Wastewater Treatment and
Collection Systems
(millions of dollars)*

Year	Reporting Units	Personnel Costs	O & M Costs	Capital Costs Local	Capital Costs Non-Local	Interest
1976	494	42.9	50.8	7.9	67.9	4.1
1977	499	45.7	58.7	7.9	71.7	5.4
1978	499	50.1	68.4	9.3	19.7	6.4
1979	505	54.7	80.4	9.7	106.8	5.6
1980	506	60.0	87.4	9.8	112.4	7.7

*Figures exclude county wastewater treatment systems, sanitary districts, and non-reporting cities, villages and special districts.

Source: Computer print-out from Auditor's Office (State of Ohio), "Local Government Reports," September 27, 1982.

Category IIA -- Advanced Secondary Treatment;

Category IIB -- Advanced Treatment;

Category IIIA -- Infiltration/Inflow Correction;

Category IIIB -- Major Sewer System Rehabilitation;

Category IVA -- New Collectors and Appurtenances;

Category IVB -- New Interceptors and Appurtenances;

Category V -- Correction of Combined Sewer Overflows;

Category VI -- Treatment and/or Control of Stormwaters.

The 1982 Needs Survey, as summarized in Table 22, estimated that the largest backlog of needs occurred in Category VI ($4.8 billion backlog) and Category V ($3.9 billion backlog). The next largest group of backlog needs in the state were found in Category I ($693 million), Category IVA ($669 million), Category IVB ($464 million), and Category II ($462 million), with relatively minor backlog needs in Category IIIA ($134 millions) and IIB ($21 million). The backlog needs estimates for 1982 are up slightly over the 1980 backlog needs figures, except for Category IIA which exhibited fewer backlog needs, due to the fact that needs increased at a faster rate than outlays.

An indicator of future needs appears in the last column of Table 22. By the year 2000, the needs estimates for Ohio (in 1982 dollars) climb 40 percent (to $3.4 billion) over the 1982 figure, an increase that discounts the effects of inflation. The largest program, secondary treatment requirements, are projected to exceed $1 billion, while new collectors and interceptors (Category IV) amount to over $1.5 billion in needs. The needs figures, as indicated above, were derived to meet the requirements of EPA, not to replace, rehabilitate or restore portions of wastewater

Table 22

EPA Estimates of Backlog
Needs and Projected Year 2000
Needs by Category
(millions of 1982 dollars)

		Backlog Needs, 1980	Backlog Needs, 1982	Projected Needs, 2000
I	Secondary Treatment	$652	$693	$1,045
II		459	462	641
IIA	Advanced Secondary Treatment	---	393	522
IIB	Advanced Treatment	---	69	119
IIIA	Infiltration/Inflow Correction	255	134	135
IIIB	Major Sewer System Rehabilitation	13	21	21
IVA	New Collectors and Appurtenances	663	669	806
IVB	New Interceptors and Appurtenances	312	464	781
V	Correction of Combined Sewer Overflows	3,695	3,878	3,878
VI	Treatment and/or Control of Stormwaters	4,847	4,753	4,753
	Total I-IV	$ 2,354	$ 2,443	$ 3,429
	TOTAL	$10,896	$11,074	$12,060

Source: 1982 Needs Survey, Cost Estimates for Construction of Publicly Owned Wastewater Treatment Facilities, December 31, 1982.

treatment systems that are ineligible for EPA funding, and certainly not for maintaining and operating the system. Indeed, since maintenance is a wholly local responsibility, no estimates are available for maintenance needs on these systems. However, OhioEPA did estimate the O & M costs for Category VI improvements. Those estimates amounted to $225.2 million for 1982 and are projected to rise to only $252.4 million by the year 2000.

Expenditures and Needs.

Assuming the capital outlay total for FY81, which was $521 million, remains the same for the near future, a "gap" can be calculated between needs and outlays. The $12.1 billion needs figure for the year 2000 when divided by eighteen (or the number of years for which that needs figure was calculated) leaves an annualized needs figure of $670 million (1982 dollars). In FY81 capital outlays amounted to $521 million or, in 1982 dollars, $552 million. If outlays in 1981 can be considered typical of outlays in future years, the annual gap, then, is projected to be $118 million (1982 dollars) annually for each of the next eighteen years.

CHAPTER 6: PUBLIC WATER SUPPLY SYSTEMS

Over 1,600 public water supply systems exist within the state of Ohio supplying over 1,438 million gallons daily (MGD) to almost nine million inhabitants. Between 1955 and 1980 per capita consumption increased by only 13 percent. The major source of water for the municipal water supply systems is Lake Erie with lesser amounts from inland surface water, underground water, and the Ohio River (Table 23).

Municipal water supply systems are fairly autonomous in their operations and have few reporting requirements to higher level governments. Other than total annual capital and operating expenditure data, for example, which are reported in aggregate form to the U.S. Bureau of the Census, little information exists in readily usable form. And while OhioEPA does make inspections of water plants in order to ascertain their structural problems, none of that data is consolidated into one file. However, Ohio's Department of Natural Resources (ODNR) has surveyed the municipal water systems in an attempt to estimate the expansion needs of those systems. Expansion needs refer only to those needs (projected by municipalities) to serve a growing population. The needs estimates, therefore, do not include replacement and rehabilitation requirements of already constructed systems.

These expansion needs were aggregated and projected to the year 2020. Table 24 indicates the magnitude of the state's water supply needs. Currently the backlog of expansion needs exceeds

Table 23

MUNICIPAL WATER SUPPLY USE, BY SOURCE, OHIO — 1955 THRU 1980

Year	Population Served	Water Withdrawal by Source — MGD					Gallons Per Capita Daily	Disposal MGD	Water Consumed
		Lake Erie	Ohio River	Inland Surface	Under-Ground	Total			
1955	6,791,052 Percent of Use	429.6 44%	106.8 11%	221.1 23%	208.2 22%	965.6 100%	142	848.8 88%	116.8 12%
1957	7,332,791 Percent of Use	430.2 43%	106.7 11%	253.3 25%	206.0 21%	996.2 100%	136	866.7 87%	129.5 13%
1970	8,433,079 Percent of Use	497.0 39%	141.4 11%	324.6 25%	323.4 25%	1,286.3 100%	153	1,131.9 88%	154.4 12%
1975	8,750,000 Percent of Use	521.8 38%	145.7 11%	345.5 26%	342.0 25%	1,355.0 100%	155	1,206.0 89%	149.0 11%
1980	8,954,000 Percent of Use	530.0 37%	149.6 10%	376.3 26%	382.8 27%	1,438.7 100%	161	1,294.8 90%	141.0 10%

Reference: Ohio Division of Water;

1955 - Water Use In Ohio, Water Inventory Report, No. 6, 1959.
1957 - Water Use In Ohio, Water Inventory Report, No. 6, 1959.
1970 - Estimated Census of Ohio Water Withdrawal (Out-of-Print).
1975 - Inventory of Municipal Water Supply Systems, Water Inventory Report No. 24, 1977.
1980 - Census of Ohio Water Use (unpublished data on file), 1981.

$330 million and 670 MGD. If that backlog is addressed, which officials at the state considered impossible, over $300 million would need to be spent between 1980 and 2000 (or $15 million annually) and $195 million between 2000 and 2020 (or over $9 million annually). Including the backlog of expansion needs, then, over $834 million (1980 dollars) should be spent on municipal water supply systems over the next forty years. GOVERNMENTAL FINANCE indicates that water supply authorities and departments spent an annual average of $90.6 million for 1979-81. This figure, however, includes all capital expenses, not just outlays for expansion purposes.

The state of Ohio, through ODNR's Division of Water, can participate in some water projects in which cases the state becomes part owner. It has requested over $84 million for FY85-FY88, but expects to receive considerably less (Table 25). That price tag, however, is almost inconsequential when compared with just the backlog of expansion needs.

TABLE 24: Expansion (Capacity) Needs of Municipal Water Supply Systems (1980 Dollars)

	Backlog	1980-2000	2000-2020	TOTAL
Cost	$331,864,000	$307,526,000	$195,028,000	$834,418,000
MGD	670.14	629.92	350.88	1,650.94

SOURCE:ODNR, Water Resources Development Section, Division of Water, THE OHIO WATER PLAN: RESOURCE DEVELOPMENT NEEDS FOR PUBLIC WATER SUPPLY, 1982 (Draft Document).

TABLE 25: State Participation in Capital Improvements, Recommendations for FY85-88 (Millions of 1983 dollars)

FY85	FY86	FY87	FY88
$23.6	$18.6	$27.7	$14.9

Although water systems are generally in good fiscal condition, their capital needs exceed the figures presented in Table 21. Because almost half of all Ohio's water systems were constructed prior to World War II, according to one official at OhioEPA, replacement and renovation needs of the existing physical plant must surely play an important role in any water authority's capital plans. The expansion needs reported herein, therefore, become only a small part of the overall water supply needs of the state when discussed in conjunction with renovation and replacement needs of an aging water system. Unfortunately, no data on these latter sets of needs exist in aggregate form.

CHAPTER 7: SOLID WASTE DISPOSAL SYSTEMS

The state of Ohio divides the responsibility of solid waste disposal between two operating divisions within OhioEPA. One has reporting requirements for hazardous waste, the other for non-hazardous waste. Over 75 different treatment methods exist for hazardous waste. The four most common methods accounted for 41 percent of the total that was treated, stored, and disposed (or "TSD'd") in Ohio. Thirty-five percent (or 1.3 million tons) of hazardous waste was TSD'd using the deep well underground injection method, 4.2 percent (or 152,588 tons) was TSD'd in landfills, 1.3 percent incinerated, and 0.6 percent required land treatment. Total hazardous waste amounted to 3.7 million tons in 1981. All sites are privately owned and required by the state to file reports with OhioEPA. No expenditure data, condition assessments, or future facility needs exist for hazardous waste disposal sites.

Non-hazardous waste disposal or land fill sites are required to report to another division within OhioEPA. Over 220 such landfills serve the entire state of Ohio. Municipalities, townships, and counties own one-third of the landfills, while the remainder is privately-owned. Approximately one-third of these are projected to be filled within five years, requiring construction of new buildings and purchase of additional land. No estimates of the cost of land (which varies by location) exist, so no needs estimates are available. Also, no operating cost data are available at the state level. Those data are kept at the local operating level.

CHAPTER 8: REVENUE CONSTRAINTS AND "NEEDS": MEASURING THE GAP

Between FY76 and FY82, the state of Ohio increased expenditures by over 68 percent (when the inflation rate, as measured by the Consumer Price Index, increased by 69.6 percent) and between FY76 and FY85 the increase is projected to be 147 percent (during which time the inflation rate is projected to be 93.3 percent) (see Table 26). Annual percentage increases in expenditures have been erratic from FY76 to FY82, ranging from only 2.5 percent between FY79 and FY80 to over 13 percent on three different occasions (FY76-FY77, FY78-FY79, and FY80-FY81). By far the largest percentage increase in outlays is projected at 26.3 percent for FY82-FY83. After that surge, increases should slow to 8.5 percent between FY83 and FY84, then to only 4.3 percent for the following year.

The economic downturn damaged considerably the fiscal picture of Ohio in FY82 and FY83. Cutbacks in proposed outlays and "temporary" increases in the state income and sales taxes were employed in FY82. After Governor Celeste assumed office in January 1983, the state faced another projected deficit in FY83 of over one-half billion dollars. Additional cutbacks of $282 million were ordered and the income tax and sales tax became "permanent" in order to avoid an FY83 deficit. Further, as a result of declining state fuel tax revenues (due to decreased consumption levels and

Table 26

Expense Summary - All Funds
Fiscal Years 1980 Through 1985
(In Millions of Dollars)

Funds [1]	EXPENSE									
	Actual 1976	Actual 1977	Actual 1978	Actual 1979	Actual 1980	Actual 1981	Actual 1982	Estimate 1983	Estimate 1984	Estimate 1985
General Revenue	$3,456.2	$3,808.9	$4,140.2	$4,551.5	$5,149.4	$5,671.0	$6,040.9	$7,228.3	$8,014.1	$8,900.4
Special Revenue	877.3	1,041.9	1,203.0	1,391.9	1,517.1	1,860.6	1,955.0	2,898.5	2,921.0	2,947.1
Highway Purpose	530.5	520.0	550.0	649.9	521.4	545.8	752.3	843.2	1,019.2	1,001.6
Highway Safety	82.5	79.0	79.7	89.5	90.6	94.6	105.0	128.4	130.2	134.8
Capital Project	101.6	303.9	112.6	332.9	90.4	65.4	122.8	209.6	358.2	0
Bond Retirement	159.9	162.1	156.3	159.2	155.3	162.9	167.5	177.2	171.5	177.8
Revenue Sharing	92.6	89.6	91.4	92.6	92.5	46.0	.0	.0	.0	.0
Revenue Distribution	352.3	542.5	491.2	579.3	459.4	627.8	699.3	692.1	703.5	734.0
Waterways Safety	1.8	5.2	3.2	7.7	1.3	6.2	1.7	8.7	5.6	5.8
Wildlife	8.6	9.4	9.3	11.5	12.0	18.7	19.6	29.2	22.1	22.9
Liquor Control	372.6	369.1	387.5	357.2	370.4	396.6	395.1	436.6	385.3	399.3
Workers' Compensation	0.0	0.0	28.9	33.6	41.3	49.5	63.7	77.3	90.4	96.6
Lottery	74.9	101.3	76.8	48.1	59.4	137.6	176.3	190.8	206.4	213.6
Total Expenses	$6,110.8	$7,032.9	7,330.1	8,304.9	$8,560.5	$9,682.7	$10,499.2	$12,919.9	$14,027.5	$14,633.9
Less: Interfund Transfers	(462.0)	(497.7)	(512.6)	(529.9)	(587.9)	(649.6)	(649.1)	(469.8)	(523.1)	(548.9)
TOTAL EXPENSE EXCLUDING TRANSFERS	$5,648.8	$6,535.2	$6,817.5	$7,775.0	$7,972.6	$9,033.1	$9,850.1	$12,450.1	$13,504.4	$14,085.0

The General Revenue Fund receives by far the largest share of all tax revenues (with the exception of those that are highway-related), earnings on deposits, liquor and lottery profit transfers, Federal Revenue Sharing Trust Fund transfers, and certain federal reimbursements. By statute, any revenue that is not earmarked for a specific purpose is deposited in the General Revenue Fund. The Legislature has almost total discretion with regard to the uses of General Revenue Fund moneys, and this fund provides for most of the state's efforts in public education, welfare, higher education, mental health and mental retardation, corrections, property tax relief, and the general operations of state government agencies. Appropriations from the General Revenue Fund comprise over one-half of total operating expenses for state government.

Special Revenue funds receive revenues from a great many sources. There are a great number of these funds, i.e., Highway Operating Fund, Wildlife Fund, Waterways Safety Fund, and a great many more special accounts within the State Special Revenue Fund, Federal Special Revenue Fund, and Intragovernmental Service Fund. However, the funds and special accounts have one major factor in common: the revenues have to be used for purposes specified in the constitution, state statutes, federal programs, or other authorized purposes. Existence of such special revenue sources may reduce the need to allocate General Revenue Fund moneys for some program efforts.

There are a number of Capital Funds which receive the proceeds from the sale of bonds. The authorization for the issuance of bonds is made by the General Assembly in accordance with voter-approved Constitutional amendments permitting the undertaking of debt. The debt is repaid through Bond Retirement Funds. These moneys are used for new buildings and major construction renovations. A complete description of each Capital Fund is found in Section 15 of this document.

The Liquor Control and Lottery Funds are classified as Enterprise Funds. The operations are supported by sales revenues, and the profits from both operations are transferred to the General Revenue Fund.

There are nine funds known as Revenue Distribution Funds, which receive taxes and other moneys collected by the state on behalf of cities, counties, and other units of government. Statutes determine which revenue sources are earmarked for these funds and the formulas for distributing the money. A complete description of these funds is found in Section 16 of this document.

For each Capital Fund that has been established by voter-approved Constitutional amendment, there is an associated Bond Retirement Fund established for the purpose of receiving revenue pledged towards retirement of the bonds. These moneys are used to make scheduled payments of principal and interest. A description of these funds is found in Section 15 of this document.

The Revenue Sharing Trust Fund was established in accordance with federal regulations to received Ohio's entitlement of general revenue sharing moneys. Initial receipts were appropriated for a variety of capital improvement projects. Since 1975, the receipts have been transferred to the General Revenue Fund.

Source: Office of Budget and Management, Executive Budget (various years).

more fuel efficient automobiles), tax increases went into effect over a two year period between 1981 and 1982 on fuel consumption in order to generate sufficient funds for Ohio's highway programs. Gross revenues from motor vehicle fuel taxes fell from $416.6 million in FY79 to $377.9 million in FY81 (see Table 27). Due to the tax increases which raised the state tax per gallon from 7 cents to 12 cents -- comprised of a 7 cent fixed rate and a 5 cent (maximum) variable rate -- , motor vehicle fuel tax revenues increased to $554.7 million by FY82.

TABLE 27: Transportation Revenues and Fuel Consumption

FY	Gross Revenues from Motor Vehicle Fuel Tax ($millions)	All Fuel (millions of gallons)	Gasoline (millions of gallons)
1972	$350.1	5,133.1	4,673.5
1973	371.2	5,463.3	4,940.6
1974	371.4	5,459.4	4,902.9
1975	371.3	5,458.4	4,929.9
1976	379.6	5,593.5	5,031.5
1977	397.7	5,835.4	5,212.8
1978	405.8	5,951.7	5,284.8
1979	416.6	6,100.4	5,365.1
1980	391.7	5,730.0	4,999.1
1981	377.9	5,455.6	4,723.1
1982	554.7	5,252.4	4,508.2

SOURCE: ODOT, "Motor Vehicle Fuel Taxes", May 1983, internal document developed for testimony to Ohio General Assembly (these figures do not correspond with those in Table 28; these data are revised as of May 1983).

The General Revenue Fund, the largest fund for the state's budget, traditionally supplies approximately 60 percent of the state's total funds. The largest revenue sources for the General Revenue Fund are the sales tax, personal income tax, motor vehicle fuel tax, and corporate franchise tax. Together these four tax sources account for two-thirds of the revenues for the General

Revenue Fund and approximately 40 percent of total state revenues (all funds combined). The General Revenue Fund provides a small amount of funds to the infrastructural activities defined in this study. However, if the term "infrastructure" were expanded to include other activities (e.g., corrections, education, general building, mental health facilities), the General Revenue Fund would provide substantial revenues to infrastructural activities.

The state has had some obvious problems in projecting revenues for the past two years. The recession was longer and more severe than was expected, resulting in emergency tax increases and rendering most revenue projections considerably less than accurate. Most of the state's Office of Budget and Management (OBM) revenue models relied on two (or occasionally three) variable regression equations to project tax revenues. The proven explanatory power of past revenue projections was very good, but for FY82 and FY83 the historical relationships between the variables appeared not to hold. The predictive powers of the models were inadequate and erroneous; indeed, the variables used in the models were suspect.

For example, the regression equation for the non-auto sales and use tax was stated as a function of U.S., not Ohio, disposable personal income. The figure for the entire nation was used because Ohio's personal disposable income was found to be correlated with the U.S. figures over time. Using that regression equation, projected revenues for FY82 were $1,445.1 million. Only after the state sales tax increased 25 percent from four to five percent did revenues come close to this figure (see Table 28). The same problem arose with the personal income tax revenue projections. OBM projected $1,330 million in revenues for FY82,

Table 28

INCOME - ALL FUNDS
FISCAL YEARS 1976 THROUGH 1985
(IN MILLIONS)

INCOME SOURCE	ACTUAL 1976	ACTUAL 1977	ACTUAL 1978	ACTUAL 1979	ACTUAL 1980
TAXES					
NON-AUTO SALES AND USE	$ 615.3	$ 870.1	$ 997.7	$ 1,108.3	$ 1,178.5
AUTO SALES AND USE	216.3	259.6	303.6	322.0	272.2
PERMISSIVE SALES TAX	82.3	116.1	127.3	147.9	158.6
PERSONAL INCOME	876.3	684.5	852.5	960.4	1,137.4
PUBLIC UTILITY	196.9	213.5	298.2	359.0	376.0
CIGARETTE	198.2	197.7	203.5	204.5	209.2
SEVERANCE	3.9	3.9	3.8	4.6	4.4
ALCOHOLIC BEVERAGE	37.8	40.3	39.7	42.6	43.5
FOREIGN INSURANCE	88.8	93.2	105.7	113.3	123.0
LIQUOR GALLONAGE	33.5	31.7	32.2	32.4	32.7
HORSE RACING	25.0	21.4	22.6	26.5	26.8
MOTOR FUEL	368.0	404.2	413.0	432.6	407.2
CORPORATE FRANCHISE	385.3	444.8	544.8	590.8	603.0
HIGHWAY USE	39.7	43.9	46.8	50.8	49.4
MOTOR TRANSPORTATION	2.7	1.2	3.5	2.3	2.8
INTANGIBLE PERSONAL PROPERTY	98.2	108.4	119.6	132.4	142.1
ESTATE	32.8	24.8	34.1	42.8	37.2
LICENSES AND FEES					
OCCUPATION AND BUSINESS	48.8	52.8	54.1	61.5	72.2
VEHICLE AND OPERATOR	225.7	145.6	153.6	230.5	166.6
OTHER	8.7	9.5	9.8	10.7	17.8
INTERGOVERNMENTAL					
REVENUE SHARING	85.4	88.6	98.9	92.3	92.5
FEDERAL AID	1,293.7	1,395.4	1,552.3	1,761.5	1,879.4
RECEIPTS FROM LOCAL GOV.	42.7	31.4	48.9	33.8	36.3
SALES AND CHARGES FOR GOODS AND SERVICES					
LIQUOR STORE RECEIPTS	348.6	366.2	382.4	354.2	373.1
LOTTERY SALES	88.4	105.8	73.4	45.4	57.2
ALL OTHER	32.7	36.4	58.1	51.1	62.5
OTHER REVENUE					
PATIENT SUPPORT	22.7	22.8	24.8	28.4	30.3
EARNINGS ON INVESTMENTS	71.5	81.8	55.1	76.1	114.3
MISCELLANEOUS	33.6	29.3	41.1	43.9	87.3
TRANSFER FOR INT	1.8-	.8	.2-	.1-	.1
NON-REVENUE RECEIPTS					
SALES OF NOTES AND BONDS	279.9	128.8	198.8	255.8	188.8
INTERAGENCY SALES	26.7	16.8	18.6	14.2	25.8
COUNTY TAX	38.9	24.9	16.9	48.2	19.9
TRANSFER					
FEDERAL REVENUE SHARING	.8	.8	.1	.8	.8
DEBT SERVICE	.8	.1-	.1-	.1	.8
LOTTERY PROFITS	.8	.8	.8	.8	.8
OTHER	.1	.8	.2	.2	.1-
GRAND TOTAL	$ 5,662.7	$ 6,881.5	$ 6,911.2	$ 7,471.4	$ 7,938.4

Table 28

INCOME - ALL FUNDS

FISCAL YEARS 1976 THROUGH 1985

(IN MILLIONS)

INCOME SOURCE	ACTUAL 1980	ACTUAL 1981	ACTUAL 1982	ESTIMATE 1983	ESTIMATE 1984	ESTIMATE 1985
TAXES						
NON-AUTO SALES AND USE	$ 1,178.5	$ 1,372.2	$ 1,541.2	$ 1,656.2	$ 1,779.3	$ 1,924.6
AUTO SALES AND USE	272.2	277.1	284.2	328.0	383.7	445.8
BUSINESS SERVICES EXCISE TAX	.0	.0	.0	.0	95.0	160.0
PERMISSIVE SALES TAX	158.6	185.7	217.1	241.5	258.3	278.9
PERSONAL INCOME	1,137.4	1,245.6	1,362.1	2,134.0	2,538.9	2,832.6
PUBLIC UTILITY	376.0	467.3	497.9	622.3	613.6	691.1
CIGARETTE	209.2	211.1	200.0	195.5	197.7	199.4
SEVERANCE	4.4	4.2	4.0	3.9	7.4	7.7
ALCOHOLIC BEVERAGE	43.5	47.3	44.6	40.7	41.3	42.4
FOREIGN INSURANCE	123.0	126.0	125.7	131.7	134.5	139.2
LIQUOR GALLONAGE	32.7	31.5	30.4	30.5	30.5	30.1
HORSE RACING	26.8	24.9	26.3	25.2	26.6	27.3
MOTOR FUEL	407.2	382.9	538.6	597.2	632.8	639.7
CORPORATE FRANCHISE	603.0	583.9	670.1	593.0	777.3	929.4
DOMESTIC INSURANCE FRANCHISE	9.0	10.6	34.4	25.3	27.0	30.0
SOFT DRINK EXCISE	.0	.0	12.7	17.4	.8	.0
HIGHWAY USE	49.4	46.4	46.1	54.0	53.3	59.6
MOTOR TRANSPORTATION	2.8	2.8	2.0	2.0	2.1	2.1
INTANGIBLE PERSONAL PROPERTY	142.1	148.2	159.4	109.2	118.1	128.5
ESTATE	37.2	40.6	49.1	65.0	36.5	15.0
LICENSES AND FEES						
OCCUPATION AND BUSINESS	63.2	64.0	75.7	79.0	86.6	90.3
VEHICLE AND OPERATOR	166.6	287.5	254.4	261.6	265.3	267.1
OTHER	17.0	16.0	16.5	16.0	17.0	17.3
INTERGOVERNMENTAL						
REVENUE SHARING	92.5	46.0	.0	.0	.0	.0
FEDERAL AID	1,879.4	2,268.9	2,271.2	2,589.3	3,159.2	3,279.0
RECEIPTS FROM LOCAL GOV.	36.3	46.0	55.6	53.0	62.0	64.6
SALES AND CHARGES FOR GOODS AND SERVICES						
LIQUOR STORE RECEIPTS	373.1	396.9	391.3	387.6	393.4	397.3
LOTTERY SALES	57.2	132.6	171.9	188.3	204.0	211.6
ALL OTHER	62.5	71.7	95.0	110.8	135.1	142.5
OTHER REVENUE						
PATIENT SUPPORT	30.3	32.8	32 9	33.0	32.0	32.0
EARNING ON INVESTMENTS	114.3	111.7	146.2	101.5	86.2	89.7
MISCELLANEOUS	67.3	79.8	73.6	98.1	100.5	72.9
TRANSFER FOR INT	.1	.0	.1-	6.2	5.8	6.5
NON-REVENUE RECEIPTS						
SALES OF NOTES AND BONDS	188.8	388.8	122.2	293.8	285.3	190.7
INTERAGENCY SALES	189.1	314.7	322.6	1,012.2	946.9	986.7
COUNTY TAX	19.9	29.9	29.8	29.8	30.8	30.8
TRANSFER						
DEBT SERVICE	.0	.1-	.0	.0	.0	.0
OTHER	.1-	.1-	.1	.0	.0	.0
GRAND TOTAL	$ 8,181.7	$ 9,428.2	$ 9,904.8	$ 12,132.8	$ 13,485.2	$ 14,462.6

but again only after enactment of a 40 percent hike in the state's personal income tax rate did actual receipts match the projections. OBM used two methods to estimate the corporate franchise tax revenues; both methods relied on a two variable regression equation in which "U.S. corporate profits before taxes" was the independent variable in both cases -- assuming a correlation between the national figure and Ohio's corporate profits. The error term was rather large in FY81, a year which witnessed $70 million less revenues than predicted. By FY82, however, revenues exceeded projections by $85 million. Other revenue sources relied on similar simple models. During the last two fiscal years, then, revenue forecasts have contained a great deal of error.

OBM is now attempting to improve their revenue models and has contracted with Chase Econometrics to develop an Ohio-specific revenue model. If the new model reduces error, it would enhance the public investment decision making process. In the EXECUTIVE BUDGET for FY84-FY85, OBM notes that "every 1.0 percent increase in the Ohio unemployment rate over estimates reduces revenue receipts by $115 million and increases state welfare costs by $27 million." With $142 million at stake for every one percent error in the unemployment rate, accurate forecasts are necessary first steps to sound public investment decisions.

ODOT is funded almost exclusively by fuel taxes and federal grants, and prepares its budget in a quasi-autonomous fashion (i.e., OBM must approve ODOT's budget, but historically few or no changes have been required). ODOT's revenue projections, therefore, depend upon the amount of available federal grants that can be leveraged and the amount of fuel taxes that are collected.

Revenue projections for fuel taxes tend to be based on estimates of the change in fuel consumed within the state. These projections do not rely on any mathematical models, but rather on a qualitative appraisal of historical trends, fuel economy for passenger cars, and vehicle miles traveled.

For all infrastructural categories, revenue projections appear to be made without consulting departmental "needs" statements; the process of linking needs to revenue projections appears to take place after projections are made. It is assumed that "needs" always exceed revenues. Therefore, it would be instructive to analyze the "needs" estimates developed in earlier chapters and place them in the context of revenue projections and expected expenditures in order to develop a "guesstimate" as to the gap between needs and resources. However, it must be noted that the "needs" figures are very incomplete. For highways, the bulk of the highways in the state are unexamined (i.e., data on local roads and on Federal Aid Secondary system highways are unavailable). No O & M "backlog" data are available for wastewater treatment authorities, water supply systems, and airports. And no capital replacement or renovation "needs" exist for wastewater treatment, water supply, and solid waste disposal systems.

Projections for FY84 and FY85 are contained in the EXECUTIVE BUDGET FOR THE BIENNIUM JULY 1,1983 TO JUNE 30,1985. Total revenues for the Department of Transportation for FY84 are expected to increase by 21.8 percent from $868.5 million to $1,074 million and then to decrease slightly by FY85 to $1,040.4 million. The enormous increase between FY83 and FY84 is accounted for almost entirely by federal grant increases, due in part to anticipated

revenues from the five cents per gallon increase in the federal motor fuel tax and federal Bridge Replacement funds. Revenues from the federal government are estimated at $566.1 million in FY84 and $545.0 million in FY85 -- almost double the FY83 figure of $265 million. It should be noted that use of federal funds from the nickle a gallon tax is restricted to capital or non-operating outlays. Resurfacing, often financed as an operating item in most cities and states, currently is considered to be a capital item for federal purposes. However, pot hole filling, spot patching, sealing, and other traditional "maintenance" activities are ineligible. Therefore, greater outlays for capital projects are anticipated over the next few years due to the augmented federal presence; not so for maintenance projects, except for resurfacing.

Although it might appear that increased ODOT revenues from federal sources and state motor fuel taxes should begin to address highway and bridge needs for FY84 and FY85, upon closer examination the fiscal situation is getting worse. First of all, revenues from the motor vehicle fuel tax are projected to decline or stabilize in current dollars for two reasons: (1) automobiles will be more fuel efficient; and (2) the tax rate on motor fuel has reached its legal maximum. In constant dollars, revenues will actually decline. Declining motor fuel tax revenues contributes to the second problem: in order to leverage Ohio's share of federal highway and bridge funds, more revenues are needed in FY84-FY86 (and beyond) than the motor fuel taxes can generate. Therefore, the state is beginning to finance with bond funds what used to be financed by fuel tax revenues. ODOT expected to float $50 million in bonds in FY83 and $75 million in FY84. Of course, there is a statutory debt

ceiling of $500 million which ODOT will bump up against by FY84 ($472.9 million outstanding). The implication, then, is that fewer state-generated dollars will become available in FY85 and especially in FY86 resulting in fewer federal dollars leveraged and a signficant reduction in total highway and bridge outlays.

The outlook for FY86 and beyond appears to be gloomy for highways and bridges -- assuming no increase in the motor vehicle fuel tax. The trend towards lower ODOT outlays actually begins in FY84. The EXECUTIVE BUDGET reflects the downward trend in motor vehicle fuel taxes. For example, the state's share of the federal Resurfacing, Restoration, and Rehabilitation (3R) program has been financed traditionally from the motor vehicle fuel taxes, as was the state's share of the Bridge Replacement program. However, in FY84 the revenue source for both programs will be the Highway Obligation Construction Fund, which is a bond fund. The state's share of 3R projects amount to $18.0 million in FY84 and $28.7 million in FY85; the state's share of the Bridge Replacement program is $16.5 million in FY84 and $13.8 million in FY85. By FY86, as more and more projects (with a state matching requirement) are financed from bonded indebtedness, ODOT's borrowing authority will diminish and, as a result, highway and bridge programs must necessarily be reduced. Hence, the discussion below on the unfinanced past and future "gap" between needs and revenues must be viewed within the context of the future financial capabilities of the state. After FY85, because of declining fuel taxes (in constant dollars), the fiscal position of the state to address its highway and bridge needs in all probability will reach a crisis stage.

MEASURING THE "GAP"

Average annual bridge "needs" amount to $120 million ($600 million in needs between FY81 and FY85). The state projects to spend a total of $81.5 million in FY84 and $68.8 million in FY85 on bridge inspections, replacement and rehabilitation (of which federal aid accounts for $65 million in FY84 and $55 million in FY85). In 1982 dollars, $140.4 million in "needs" are required each year. FY84 projections amount to $75.5 million and FY85 projections amount to $60.4 million. The estimated gap is $64.9-$80.0 million (1982 dollars) each year. This estimate, it should be noted, is very conservative because the "needs" figure was based on only replacement needs, not repair or rehabilitation needs. The gap, therefore, in reality must be much greater.

Because "needs" estimates were not developed for the Federal Aid Secondary system which is 8,482 miles in length, capital "needs" for the state system presented in Tables 8-10 represent only a reduced portion of total "needs". Total primary, urban, and interstate "needs" amount to $330 million (1980 dollars) on an annualized basis. By inflating the $330 million annualized needs to 1982 dollars using the Consumer Price Index (CPI), the revised "needs" figure is estimated to be $386.1 million in FY84 and FY85. The state expects to spend approximately $526.0 million (1982 dollars) in FY84 and $485.9 million (1982 dollars) in FY85 (excluding bridge outlays). Therefore, the gap between "needs" and revenues results in a net "surplus" (i.e., projected expenditures exceed needs) of $139.9 million (1982 dollars) in FY84 and $99.8

million (1982 dollars) in FY85. Again, because of the exclusion of the secondary system (which is almost half of the entire Federal Aid system), these figures are misleading. Also, the principal reason for the "surplus" is the projected federal revenues based on the nickel a gallon tax. If FY83 capital outlays -- which were made prior to the new federal gasoline tax -- are compared with "needs", the picture changes dramatically. In FY83, capital outlays were only $412 million (1982 dollars) compared with "needs" of $386.1 million (1982 dollars) for a much smaller net "surplus" than the FY84 and FY85 projections. However, after FY85 the picture may worsen considerably. If total revenues tend to stabilize after FY85, the "needs" gap will become insurmountable because of the following reasons: (1) "needs" estimates for the Primary system after FY85 are estimated to be $8.7 billion (1980 dollars); (2) "needs" for the Interstate system after FY86 are projected at $432.7 million (1980 dollars); (3) "needs" for the Urban system are predicted to exceed $586 million (1980 dollars); (4) the Secondary system has yet to be included; and (5) inflation, even if only modest, can wreak havoc with any cost projections. The Primary system alone would require the state's entire transportation budget for almost nine years just to address its "needs" -- an improbable scenario.

Operations and Maintenance (O & M) "needs" projections were presented above in Table 13. The "needs" estimates are inflated to 1982 dollars with the CPI. O & M outlay projections (in 1982 dollars) for FY84 are $330.0 million and for FY85 $319.6 million which translates into a tremendous gap when compared with "needs" projections (1982 dollars) of $498 million in FY84 and FY85.

However, this gap pertains only to 100 percent state-financed O & M "needs". If federal grants for 3R work (Resurfacing, Restoration, and Rehabilitation) are combined with the state-financed O & M work, the gap narrows considerably. Revised O & M outlays (in 1982 dollars) for FY84 (including the federal 3R revenues) increase to $473.7 million, resulting in a gap of only $24.3 million; and for FY85 it increases again to $455.6 million, leaving an unfinanced gap of $42.4 million. The federal 3R fund has increased primarily due to changes in the Surface Transportation Act that require 40 percent of federal aid highway monies to be spent on 3R activities. Ohio plans to reduce the amount of resurfacing funds financed only by the state from $81.7 million in FY82 to $57.0 million (current dollars) in FY85 while federal funds for resurfacing are expected to increase from $31.4 million to $155.0 million (current dollars) for the same time period.

In order to arrive at a gap figure, the federal portion should be added to O & M outlays. However, federal 3R work was included under "highways" above. In order not to double count federal aid, it is excluded from the O & M "gap" estimate. Therefore, a state O & M gap of $168.0 million and $178.4 million (1982 dollars) is projected for FY84 and FY85, respectively.

The gap for local highway O & M costs is estimated as the difference between the $1,900 million "needs" figure and actual O & M outlays in FY81 of $215.9 million (calculated as the difference between total and capital outlays as reported in GOVERNMENTAL FINANCES in 1980-81). If the $1,900 million are inflated to 1982 dollars ($2,223 million) and if O & M outlays increase at the same rate as the CPI (to $228.95 million), the annual gap would be

$1,994.1 million (1982 dollars).

Capital needs for the state's largest mass transit systems were calculated at $229.0 million in FY84 and $129.6 million in FY85 (1982 dollars). The state's share of financing these mass transit systems for FY84 and FY85 (through the Public Mass Transportation Grants Program) is expected to be $26.7 million and $25.7 million (1982 dollars), respectively. Assuming the state's share of total mass transit financing were 9.9 percent of total expenditures, a "gap" of $253.4 million for FY84 and $179.2 million (1982 dollars) for FY85 is anticipated.

The state's outlays for aviation capital improvement average $550,000 per year. "Needs" are estimated in Table 19 at $3.1 million per year, leaving an annual gap of $2.55 million. This figure refers only to the state's responsibility, not to the airport authorities' responsibilities.

In order to calculate the gap for wastewater treatment systems, total capital outlay figures which pertain to all 800 wastewater treatment systems are used. These figures pertain to all capital improvements, not just to those required by EPA as reported above. Assuming the capital outlay total for 1981, $521 million (or $552 million 1982 dollars), remains constant for the next few years and comparing those outlays with only the EPA-eligible annualized "needs" of $670 million (arrived at by dividing the projected $12.1 billion needs figure for the year 2000 by 18) leaves a gap of $118 million annually. Again, this gap is a very conservative estimate because EPA-ineligible replacement and rehabilitation needs are omitted.

Estimates of the gap for water supply systems and solid waste

disposal systems are not presented. Although expansion "needs" for water supply systems are known and average $32 million per year, no data on other capital improvement "needs" are known to exist. No data are available for solid waste disposal systems either.

Although $248 million in deferred "needs" and $670 million in future "needs" were estimated for Ohio's railroads, they are not presented in the summary table because they are privately owned.

A summary of the total estimated gap between projected expenditures and "needs" for the current year (FY84) and for the next biennium is presented in Table 29. Although it may appear that the state's portion of the gap is small once the local O & M gap for highways is subtracted, enough problems remain with the figures to caution against such a conclusion. To repeat, "needs" estimates on the largest segment of the Federal Aid system (Secondary system) are unavailable. However, if the gap is less than the reader might expect for Ohio's highway programs, credit must be given to the recently enacted federal gasoline tax of five cents per gallon. Without it, the net "surplus" would be eliminated and conceivably could become a net "deficit" of approximately $500 million. Furthermore, data on local highway capital improvements do not exist, even though over 83 percent of Ohio's highway system falls under the "local" rubric. And, as mentioned earlier, local governments expended $619 million in FY81 on highways -- a figure that is one-third the "needs" estimates for local O & M only; if capital "needs" are included, the figure can only be substantially higher.

Wastewater treatment systems, a sub-state responsibility, obviously should spend more to meet their needs. However, as the

TABLE 29

Backlog Gap and Total Gap Between Projected Expenditures and "Needs" for the Current 1984 Fiscal Year and the FY84-85 Biennium (Millions of 1982 Dollars)

	FY81-FY83 Backlog	FY84 Current "Gap"	FY84-85 Gap
Highways			
Bridges	($47)	$ 64.9	$ 144.9
Federal Aid Highways (excluding secondary system "needs")	175.7	(139.9)	(239.7)
O & M - state	515.8	168	346.4
Highways (local)	NA	NA	NA
O & M - local	5,982.3	1,994.1	3,988.1
Mass Transit	86.3 (1)	253.4	432.6
Aviation	7.6	2.6	5.1
Railroads	290.2	NA	NA
Wastewater Treatment	(2)	118	236
Water Supply Systems	388.2[3]	NA	NA
Solid Waste Disposal	NA	NA	NA
TOTAL	$7,399.1	$2,461.1	$4,913.4

NOTE:

(1) FY82-FY83 only
(2) Not comparable
(3) Expansion backlog needs only
Brackets ( ) indicate expenditures or projected expenditures exceed needs.

federal match for EPA grants is scheduled to decrease from 75 percent to 55 percent by the end of the federal FY84, the sewage treatment authorities will have to assume a larger portion of the gap in addition to their own EPA-ineligible capital improvements. Furthermore, all sewage treatment authorities are required to meet federal water quality standards by 1 July 1988, according to the 1981 Amendments to the Clean Water Act, whether or not they receive federal grants by that time. The increased financial burden should prove to be nearly impossibe for sewage treatment authorities to shoulder.

It should be noted that even if adequate funds could be generated in order to reduce or eliminate the estimated total FY84-FY85 "gap", the three-year backlog of unfinanced needs would still need to be addressed.

Finally, projections of the "gap" between needs and anticipated outlays were made to the year 2000 (Table 30). Since no official projections to the year 2000 exist (except for EPA estimates), the estimates presented below should only be considered rough and probably inexact. These projections assume that past trends would continue unaltered, that no new revenue source would be found, and that no change in the current tax rate would be implemented. In order to arrive at these "gap" figures for each selected infrastructural category -- except for water supply, railroads, and solid waste disposal for which no estimates are presented -- assumptions are made about levels of outlays. For airports, we assumed that the annual $2.55 million "gap" would remain stable until the year 2000. For wastewater treatment, the EPA Needs Survey projected the requirements to the year 2000.

TABLE 30: "Gap" Projections to the Year 2000
(Millions of 1982 Dollars)

	FY86-FY2000 "Gap"	Average Annual "Gap" for FY86-FY2000	FY86-FY2000 "Gap" Plus FY84-85 "Gap"
Airports	$ 33.3	$ 2.5	$ 43.4
Wastewater Treatment	1,770.0	119.0	2,006.9
Mass Transit	2,700.0	180.0	3,132.6
Highways O & M -- State and Local	32,430.0	2,162.0	36,764.5
State Capital (Federal Aid System)	966.0	64.4	726.3
Bridges	1,200.0	80.0	1,344.9
TOTAL	$39,104.3	$2,606.9	$44,017.7

Table 22 indicates that $12.1 billion ought to be spent by the year 2000. If we assume that the current level of capital outlays ($521 million) is maintained, an FY86-FY2000 "gap" of $1.8 billion is anticipated. Mass transit expenditures were conservatively estimated by assuming that the FY85 "gap" of $180 million would continue to the year 2000. If that assumption holds, the FY86-FY2000 "gap" for mass transit is projected to be $2.7 billion. Assumptions for the bridge "gap" are that the annual needs of the past two years ($140.4 million) would continue to the year 2000 and that outlays would average $60 million. The bridge "gap" for FY86-FY2000 is calculated as $1.2 billion. The figures for highway Operations and Maintenance unfinanced needs duplicate those for FY81-FY85. If this assumption is correct, the O & M "gap" for the state averages $168 million annually and for local governments $1,994 million annually.

The last estimate -- for the state's highway system -- attempts to incorporate the impact of both stable motor vehicle fuel tax revenues and limited bonding authority. If the state uses $30 million of motor vehicle fuel taxes (which it expects to do in FY84) for the state match to leverage federal dollars, and if the state borrows its estimated maximum of $50 million annually, then $80 million of state funds can be expected on an annual basis to match federal grants. Historically, the state match has been equal to 17 percent of the total; hence, federal matching funds should amount to $390 million. This total of $470 million amounts to a decrease of $97 million per year (compared with FY84 figures) or in 1982 dollars a decrease of $70 million. So that a more complete picture could be painted for the state's highway system, here an

attempt to estimate total highway needs, including the Secondary system, is presented. Estimates of the Secondary "gap" are premised on the assumption that the needs per mile of the Primary system approximate those of the Secondary system. This results in a "gap" of $94.3 million (1982 dollars). The impact of both declining motor vehicle fuel taxes and borrowing authority in addition to the Secondary system "gap" do not augur well for the highway "gap" estimate. The total highway "gap" is estimated to be $64.4 million (1982 dollars) annually for FY86 to FY2000.

In sum, over $44 billion (1982 dollars) in unfinanced needs are projected for FY84-FY2000. This amounts to an average annual "gap" of over $2.6 billion (1982 dollars). The magnitude of a rapidly increasing "gap" in conjunction with the backlog "gap" is a stark reminder of the need to develop appropriate policies so that the state's infrastructure might perform adequately and continuously at acceptable levels.

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